# The Chemical Age

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*NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.*

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## The King and the Benn Jubilee

To the Benn Brothers' Jubilee dinner, held in the Wharncliffe Rooms, London, on Saturday evening, remarkable as it already was for the distinction and number of the guests and the high character of the speaking, a special note of dignity was imparted by the gracious message addressed by H.M. the King to the head of the firm, Sir Ernest Benn. In this message, which is reproduced on another page, the King acknowledged his personal interest in the fiftieth anniversary celebrations of the foundation of Benn Brothers, Ltd., and expressed "the hope that every success may attend the efforts of your publishing house for the development of British trade." Sir Ernest Benn, as he read the words from the chair of one of the largest newspaper and publishing gatherings ever held in London, might have been pardoned for feeling some pride at the royal seal thus set to his own life-work and to a record of family achievement not often equalled.

The King, in his reference to Benn Brothers' efforts for the development of British trade through its numerous trade and technical journals and other publications, touches a public aspect of the firm's activities to which the highest importance has always been attached. When Sir John Benn started *The Cabinet Maker* fifty years ago he sought, like William Morris and other pioneers, to make art an inherent part of the industry, and he was one of the recognised forces in raising the level of the British furnishing industry in design and craftsmanship, to its great advantage in home and overseas markets. The part he played in that field corresponds with the movement in our leading technical and scientific industries for the recognition of science as an essential part of industry—a policy which has just been strikingly illustrated by the appointment of Sir H. B. Hartley, of Oxford, well known among chemists as a former Controller of the Chemical Warfare Department, as vice-president and director of scientific research to the L.M.S. Railway.

From the outset it has been the aim of the Benn journals to advocate the best methods of business, to promote trade by linking up producer and consumer, and to cultivate dependence on individual enterprise and initiative as distinct from reliance on State support. Of the principles, aims, and work of the firm through fifty strenuous years no better account could be offered than that supplied by the speeches at the Jubilee dinner of Mr. Walter Runciman, M.P., and Sir Ernest Benn. All that need be added is that the Jubilee celebrations, in which the firm's readers have taken so sincere an interest, is not an occasion, merely or mainly, for contemplating past successes; it is much more a new starting point for future enterprise and conquest.

## Chemistry and War

IT was just as well for the public reputation of chemistry and of science generally that the discussion that followed Dr. Levinstein's remarkable paper on "Chemical Disarmament," on Monday evening, was not made widely public. For it was as despairing in its outlook and as cynical in its ethics as any discussion could well be. It exactly expressed the fatalist mentality in which the seeds of war perpetually germinate and grow, and the bondage of which the best minds in all parties and all nations are striving to break. It seemed to assume the inevitability of a repetition of the catastrophe of 1914 and to emphasise, in its reasoning if not in its actual words, the need of preparing for it. Disbelief in the League of Nations was confessed without apology or qualification. We were reminded that primitive man is a fighter by instinct, and that Nature remains red in tooth and claw. The sea, it was said, is always at war, and the inference we were invited to draw is that mankind must be

content with the delicate moral sensibility of the shark or the fine ethical ideas of the octopus, and never hope for anything better. The Prussian doctrine of ruthlessness, against which we protested so much during the war, was enunciated almost as an axiom. The fiercer and the more ruthless the methods of war, the quicker the issue is decided.

So some of the speakers argued, ruling out the possibility of nations ever substituting reason for force or applying to one another in the mass the principles of equity that their own citizens observe among themselves. It was well, we repeat, that the discussion did not carry far, for it would do chemistry no good in the public estimation to be popularly associated with this atavistic attitude. Nothing, in fact, could damage chemistry more than its identification, in the public mind, with a fatalist war mentality. Happily, the Society itself is not committed by such views. We doubt if they represented the sense of the meeting. They certainly do not represent science generally, the true science that works always for knowledge and progress. If they did, the reply of the Chancellor of the Exchequer to applications for grants in aid would be scathing.

From the qualities that characterised the discussion, let it be said at once and emphatically, Dr. Levinstein's address was free. It was a speech of extraordinary interest and ability. Instead of encouraging, it decried war-mongering. It did not scorn, but commended, the League of Nations' work. In a style, rightly described by Professor Morgan as ruthlessly logical, it analysed the facts of the case and especially the meaning of recent treaties in their bearing on chemical warfare. The inevitability of war was never assumed, though the danger was, of course, recognised.

In the early days of THE CHEMICAL AGE Sir William Pope made a contribution that attracted widespread attention on the same subject. It was not a defence of war, but it was a brilliant satire on those who, cheerfully accepting the older and cruder barbarities of war, piously exclaimed against the new chemical arm. Dr. Levinstein restated that case convincingly. But he did more, and it was, perhaps, the most useful service in his address. He made it clear, out of his wealth of chemical knowledge and experience, that legal prohibitions of gas warfare may be deceptive in the sense that they do not accord with the facts of organic chemistry and of chemical industry, and that their vagueness leaves large loopholes for surprise open. There are facts and arguments in Dr. Levinstein's statement that all statesmen engaged in disarmament discussions or in general peace propaganda should certainly study.

## Why Not Foreign Plant?

IT was a courageous act on the part of British chemical plant manufacturers, at their annual dinner last week, to dispense with the usual toasts, and to give the evening up to a serious discussion of the question "Why Not Foreign Chemical Plant?" The result was a symposium of quite unusual interest, which brought out facts and considerations of first rate importance. The case of the British maker certainly did not suffer in the process. On the contrary, it was shown that in point of soundness of construction, quality of materials, and wearing capacity it is not easy to match British productions. Moreover, a frank recital of the complaints made against British manufacturers' methods—and such complaints are almost commonplaces in every industry—enabled various speakers to meet this airy criticism with facts and arguments that showed how unsubstantial much of it is. In addition, the British maker was able to retort effectually with instances of practices in which the foreign maker often seems to get more favoured treatment from the home user, and to explain the reasons why British makers must continue to work to a higher standard of stability than their non-British rivals. The net result was a convincing verdict in favour of the case for supporting home industry.

## Dyestuffs Organisation

IN the market reports published in our Monthly Dyestuffs Supplement to-day, our Lancashire correspondent makes some interesting comments on recent developments in I.C.I. dyestuffs policy. The interesting staff rearrangements appear to be all on the principle of "technical control," and the return of the selling department to Manchester will be recognised by all who understand Lancashire feeling as a wise step.

## The Calendar

| Feb. | | |
|---|---|---|
| 10 | Ceramic Society. 7.30 p.m. | Stoke-on-Trent. |
| 10 | Institute of Metals (Scottish Section): "Pyrometry." S. H. Hawkins. 7.30 p.m. | 39, Elmbank Crescent, Glasgow. |
| 11 | Institute of Metals (N.E. Coast Section): "Electric Heating." W. Richardson. 7.30 p.m. | Armstrong College, Newcastle-on-Tyne |
| 11 | Royal Institution: X-Ray Determination of the Structure of Cellulose." Sir W. Bragg. 5.15 p.m. | 21, Albemarle Street, London. |
| 12 | Institute of Fuel: "Oil Cracking." W. H. Jones. | Burlington House, Piccadilly, London. |
| 12 | Society of Chemical Industry (Newcastle Section): "Steam Storage in its relation to the Productive Efficiency of Industrial Processes." Dr. E. G. Ritchie. 7.30 p.m. | Armstrong College, Newcastle. |
| 12 | Royal Society of Arts: "Colour Determination in the Fashion Trades." Holbrook Jackson. 8 p.m. | John Street, Adelphi, London. |
| 12 | Institute of Fuel: "Submerged Combustion." C. Featherstone Hammond. 6 p.m. | Burlington House, Piccadilly, London. |
| 12 | Institute of Metals (Swansea Section): "The Corrosion of Non-Ferrous Metals." Dr. A. G. Ramsay. 7 p.m. | Thomas's Café, High Street, Swansea. |
| 13 | Oil and Colour Chemists' Association: "Mixing, Grinding and Refining of Paints and Enamels." S. Smith. 7.30 p.m. | 30, Russell Square, London, W.C.1. |
| 13 | Institute of Metals (London Section): "Temperature Measurement and Control in Works." H. H. Smith. 7.30 p.m. | 83, Pall Mall, London, S.W.1. |
| 13 | Leicester Literary and Philosophical Society (Chemistry Section): "Proteins in Nutrition." Professor R. H. A. Plimmer. 7.45 p.m. | University College, Victoria Road, Leicester. |
| 14 | Society of Chemical Industry (South Wales Section): "Clinker and Ash Fusion." W. Grey Davies. | Cardiff. |
| 14 | Oil and Colour Chemists' Association (Manchester Section): "Common Sense and Nitrocellulose Lacquer." R. G. Daniels. 7 p.m. | Milton Hall, Deansgate, Manchester. |

# Benn Brothers Celebrate their Jubilee

## A Gracious Message from the King

*To celebrate the Jubilee of Benn Brothers, Ltd., the firm gave a banquet at the Wharncliffe Rooms, London, on February 1. The company, numbering over 450, included many distinguished guests, representative of various public interests; the speaking was at a consistently high level; and a special dignity was imparted to the occasion by a gracious message of congratulation which Sir Ernest Benn read from the King and the text of which is reproduced on this page.*

SIR ERNEST J. P. BENN (Chairman) presided, and among the company present were Lady Benn, Sir William Plender and Lady Plender, the Rt. Hon. Walter Runciman, M.P., and Mrs. Runciman, the Rt. Hon. Wedgwood Benn, M.P. (Secretary of State for India), and Mrs. Benn, Lord and Lady Charnwood, Lord Ebbisham, Viscount Hambleden, Sir Hugh Bell, Sir Frank Newnes and Lady Newnes, Sir William Lawrence (Treasurer of the Royal Horticultural Society), the Dean of St. Paul's (the Very Rev. W. R. Inge), Mr. Arnold Bennett, the Finnish Minister and Mme. Saastamoinen, the Latvian Minister and Mme. Vesmans, the Lithuanian Minister and Mme. Bizauskas, the Estonian Chargé d'Affaires and Mme. Nollerson, Sir Robert and Lady Welsford, Sir William Crawford, Sir Charles Mallet, Sir Cecil Walsh, Lady Brooke, Sir Arthur Shirley Benn, Mr. P. D. Blumenfeld, Mr. C. E. St John Hornby, Mr. C. Lidbury (General Manager, Westminster Bank), Mr. H. P. Benn, Professor R. S. Conway, Mr. and Mrs. Claude Taylor (Exhibitions Branch, Board of Trade), Mr. and Mrs. John A. Benn, Miss Betty Benn, Miss Benn, Miss Dorothy Benn, Mr. E. G. Benn, Mr. J. F. Ronca, Mr. Davidson Pratt, Dr. J. Gordon Parker, Dr. Anderson, Professor J. W. Hinchley, etc.

An interesting feature of the reception was the attendance of a guard of honour composed of fourteen members of the staff attired in costumes symbolical of the publishing activities of the Benn organisation.

### Message from the King

The Chairman, in proposing the toast of "The King," said that in view of the very exceptional nature of the gathering and occasion, he felt justified in sending a telegram of devotion and loyalty to His Majesty. He ventured to remind the King of a speech which he made in 1901 in which he called upon England to "Wake Up," and to tell him of the way in which they had taken advantage of that speech to found those Empire Numbers that had been a feature of their business ever since. It was a great delight and honour to read the telegram which His Majesty had been graciously pleased to send in reply.

SANDRINGHAM,
*February 1, 1930.*

*The King is interested to hear that to-day you are commemorating the fiftieth anniversary of the foundation of your firm, and that on this auspicious occasion representatives of so many important trades are joining in the celebration.*

*I am commanded to convey to all present the sincere thanks of His Majesty for your message of loyal greetings, and to express the hope that every success may attend the efforts of your publishing house for the development of British trade.*

(*Signed*) CLIVE WIGRAM.

### The Toast of Fleet Street

Sir William Plender, proposing the toast of "Fleet Street," said that in common with the ordinary man who treads at times the pavement of Fleet Street, he had a great admiration and deep respect for the men to whose enterprise and daring, to whose sagacity and skill, they owed the growth of the modern press. There was no part of the world where day and night the ears of the newspaper correspondents were not open to gather news that was flashed to Fleet Street, and after treatment which varied with the needs of the patient—or the patient reader—they received at their breakfast table with unfailing regularity the morning paper with its astounding collection of facts and sometimes fiction.

There would always be a fascination about Fleet Street. Its past—remote and recent—recalled great figures, its religious communities were a memory, its old buildings were no more; but Fleet Street, the birthplace and home of the greatest press in the world, still had and would always have its romance which the lengthening years could not destroy.

To-night (Sir William continued) we celebrate an eventful chapter in the history of the great publishing house of Benn. The old buildings, occupied by the firm founded by the father of Sir Ernest, have been abandoned and their vast business is now housed in a noble building which adds to the architectural features of Fleet Street. We congratulate him on that achievement. But great as is the accomplishment of that effort, marking as it does a monumental episode in the Jubilee year of the firm's history, it will be no more enduring and it is no more noteworthy than the high position which the firm of Benn occupies in the publishing world of Fleet Street through the untiring efforts, the unwearying energy, and the genius of our honoured friend who presides over us to-night.

### Dean Inge's Reply

Dean Inge, who replied, said that for the purposes of that evening, Fleet Street became Bouverie House. Dr. Johnson, he was told, actually lived in a house on the very site of Bouverie House, and if he could revisit his former home, having ascertained that the Benn family was not of Scottish extraction, he would have smiled very graciously on their activities. For fifty years that firm had been famous for issuing excellent trade journals, and more recently it had become famous as a publishing firm, and with very great enterprise it had endeavoured to put on the market very cheap and good books which should have a really wide educational effect. The work that was being done in that way was beyond all praise. Their aim was to purify and elevate popular taste. Their hosts that evening were doing their very best in that direction. A great many of their cheap books he had read during the past year or two were most admirable, and he hoped they were as widely read as they ought to be.

### The Toast of Benn Brothers

The Rt. Hon. Walter Runciman, M.P., in proposing the toast of "The Firm of Benn Brothers," said he did so in many capacities: first of all as an old friend of the Benn family. Sir John Benn was one of his oldest and closest political and personal friends, and those who knew him knew one of the most cheerful and courageous spirits who had ever appeared in the City of London. He was for many years in the House of Commons, and he endeared himself to everyone who knew him. He had the good fortune while in the House of Commons to be accompanied by his distinguished son, Captain Wedgwood Benn. He saw some of the triumphs of his son, and they could not but regret that he was not with them that night, except in spirit, to realise the triumphs of the firm which he founded.

The time came in due course for the head of the firm to become Sir Ernest Benn, and such a combination of courage and uprightness as was characteristic of his father soon became known in the enterprise of which he was the author.

the inspiring spirit, and the driving force. He need not go through the history of the firm; but it had such a wide range that Sir Ernest was well justified in saying that his was now the largest trade publishing establishment in the Continent of Europe. It was a proud boast, fully justified by its record.

### Merciless Devotion to Efficiency

There was one thing that was uppermost in the mind of Sir Ernest, and that was his merciless devotion to efficiency. Quite rightly he had no patience with any form of stupidity, and if he had to point to one of the reasons for the success of his enterprise, it would be that he had succeeded in personating his own efficiency in the directors by whom he was surrounded.

Dealing for a moment with certain tendencies of industry and commerce, Mr. Runciman said we were living in very dark and gloomy days, and stability was one of the first necessities of our time. What had happened in London during recent months was not characteristic of British industry or commerce or finance. The real basis upon which British commerce had been built up was honesty. "Let us" he said, "still go on taking that honesty for granted, and let us believe that one of the reasons why London still remains, in spite of the war and the ambitions of other capitals, the financial centre of the world is because our bankers, our financiers, our merchants are honest men who only issue honest paper. We can rest assured that so long as the great houses of the commercial world follow the example of Benn Brothers, and call in their younger generations while they are still young, the prosperity of this Empire will return and be maintained. It is therefore because of its distinguished past, of its contributions to industry and commerce as well as to literature, and because the head of this great establishment has been wise enough to call to his aid those who are the younger children of one of the best pairs of mothers and fathers ever born in England, that we rejoice with them to-night and wish continued prosperity to the firm of Benn Brothers."

### Sir Ernest Benn's Reply

In the course of his reply to the toast, Sir Ernest Benn said: You will believe that this is a very proud moment for me. The first gathering of the staff which I remember was in 1887 in my father's sitting room in Finsbury Square, when we numbered all told fourteen or fifteen persons. If you care to take a still longer view and think of the rather under-sized boy of eleven in his mother's Sunday boots, tramping from Stepney to Mincing Lane to earn 5s. a week as a messenger, and survey all the road from then till to-night, with an Ex-President of the Board of Trade, the representatives of four European States, and this distinguished gathering to do honour to the enterprise he founded, you have a story not only full of interest, but with a very definite bearing on most of the problems that face the country to-day.

This business was founded upon an idea backed by personal courage, an idea that was scoffed at by all the experts of the day, and discouraged, so far as I can discover, by most of my father's friends. It is essentially the work of an individualist. It had no doles to support it, no facilities, guarantees, subsidies, or any of those modern devices now thought essential to success in industry. Sir John conceived the notion that mahogany and eighteenth century design might be made popular at the end of the Victorian period, and he pushed that notion against odds and in face of imminent bankruptcy to the success with which we are familiar. I mention that to remind you that this business is founded upon a consciousness of serious purpose, and we are proud to think that most, if not all, that we have done from the start until to-day has something of the same quality behind it. Were my father here to-night speaking to this splendid gathering at the end of fifty years of successful endeavour, he would undoubtedly, in language better understood in his time than it is to-day, have talked of the wonderful evidence of God's blessing.

### The Benn Organisation To-day

To-night I am in a position which is very familiar to many of those present. I feel like an editor on a Wednesday or Thursday morning with a mass of good material and no space in which to display it. There are exactly thirty-four speeches, each of which would be appropriate to this evening's entertainment. I could talk at length upon the distinguished company which has honoured us by joining in our Jubilee Dinner. I could speak for half an hour on each of the dozen trade papers, for each of them has a very wonderful story. I should love to talk to you about each of my ten colleagues, your directors, for no man was ever more happily surrounded with ideal colleagues. I could dilate upon the soul and spirit of the editorial side of the business, the avarice and greed of the advertising departments, or the enterprise of the publishing processes. Much could be said about the development in recent years of our energetic subsidiary, Ernest Benn Ltd., which has jumped right into the front rank of the book publishing world, but I am tempted to pass on, especially in the presence of Mr. Arnold Bennett and other distinguished authors, a little bit of wisdom that I picked up from the doyen of European publishers, Mr. Albert Bonnier of Stockholm. Books, he told me, are matters of genius. Some genius is wanted to write them, more genius is required to make them, but the supreme genius of all is called for in the selling of them. The story of Fisher Unwin Ltd., would interest you. I could discuss the way in which the Riders and the Agnews and the Rivingtons struggled in the distant centuries to found the craft of publishing in the City of London.

In the presence of Cabinet Ministers I should be glad to talk for half an hour about that other subsidiary, The Trade Promotion Trust, and endeavour to impress them with our belief in the great opportunities for the spreading of prosperity that lie in the development of consumer credit. I am sure that I could keep you interested with a description of my wonderful tour of the Baltic States, but I must content myself with just acknowledging the delightful and generous hospitality that was so freely showered upon me last autumn. If any of you wish to know what it feels like to be a person of importance take a trip to the other side of the Baltic Sea and let it be whispered that you are in some way connected with *The Timber Trades Journal*. We are to-night especially grateful to the distinguished diplomats from Finland, Estonia, Latvia and Lithuania who have honoured us by attending our jubilee dinner and yet it seems the longer I live the better they seem to like me, and the members of my staff are my only references.

### Bigness with Efficiency

We have become so big that it is more than ever difficult to maintain that intimate personal association and friendship which is the very essence of our organisation. I am, of course, proud of our size, but I do not believe in size merely for its own sake, any more than I believe in circulation just for the sake of numbers. We want to be just so big as to give adequate stability and to secure the maximum of efficiency.

I should have liked the Lord Privy Seal to have been here to hear our views on employment, for we can claim to know something about employment in our own line of business. Our wages bill in 1880 started at £5 2s. a week, in 1926 it passed £50,000 a year, and in 1929 was £71,000. I am talking, of course, only of the publishing and administrative staffs which we directly employ. This growth is explained by a constant serious endeavour to get rid of work, to do without people and to put one man into two jobs. We find that there is always a market for the product of work undertaken and executed in this spirit. But we have one or two little ideas of our own. In the whole of our history we have never sacked anybody on account of lack of trade. That does not seem to us to be an adequate reason for shirking our responsibilities as employers. Our business is to find the work, and so far we have succeeded fairly well. But my difficulty has not been so much to find jobs to put men into as to find men to fill the jobs that are waiting to be done.

### Basic Idea of the Business

I take no credit for the truly remarkable spirit which permeates our concern. The basic ideas with which it is saturated come from the heart and the brain of Sir John, and such is their quality that they continue to live. The organisation of our enterprise denies in itself a great deal of the nonsense that is talked by experts in such matters. It is summed up in a wonderful phrase in the address which was presented to me and my wife on our silver wedding. We are "colleagues and friends in a great fellowship of work in which individual effort has been happily reconciled with central control." Perhaps the real secret is in the serious purpose of the business as a whole. No proposition that has nothing but profit in it makes any appeal to us. Our business is to print sense as distinguished from sensation, to inform rather than to inflame. Like most really good concerns, notwithstanding our phenomenal prosperity, no great personal fortunes have been made out of this business. Our aim is rather to found a solid

institution. We work for profit, we have to balance our accounts, but we have never made from the nature of our work more profit than is necessary to give that balance and security which is essential to all. It is an open secret that in the recent industrial boom your proprietors might easily have become millionaires had they been actuated by no higher motive than mere personal gain.

Two other points, and two only, must be mentioned on an occasion like this. What I have already said is sufficient explanation of the enthusiastic and delightful way in which the staff as a whole has adopted the John Benn Hostel. It is perfectly natural that an institution such as ours should not exactly feel the need, but rather take great joy in backing a great and good work founded as a memorial to our own late chief. We held recently what I believe to be the only bazaar that has been held in an office in the city of London, and a very successful function it was. You will, I know, be interested to hear that the Lord Mayor has been kind enough to place the Mansion House at my disposal on the 27th of May next for the third Annual Banquet of the John Benn Hostel, and you will also welcome the news that Viscount Astor will preside and the Lord Chief Justice will be the chief speaker.

### The Work of the Future

Finally, some people fail to realise that the creation and the establishment upon a sound and permanent basis of a great business is a two or three-generation job. Our business, with all its success, is, as most of those present here this evening know quite well, not much more than a quarter developed even now, and there is another 75 per cent. to do to reach the point of satisfaction in the things that we are attempting at the moment. Sir John did not live to see the entry of the third generation into the business, but some of us older ones are very happy to notice day by day little bits of the wisdom, the friendly helpfulness, and the rare personal attraction of the grandfather reappearing now and again in first one and then another of the three grandsons. For myself, I am very happy to be able to agree with the Welsh Member of Parliament who spoke more wisely than he knew when he told the Speaker that "we are only following in the footsteps of those who are coming after us."

I am not always in agreement with Mr. Bernard Shaw, but I venture to use by way of peroration his words when I say, "Life is no brief candle for me; it is a sort of splendid torch which I have got hold of for the moment, and I want to make it burn as brightly as possible before handing it on."

### "The Staff"

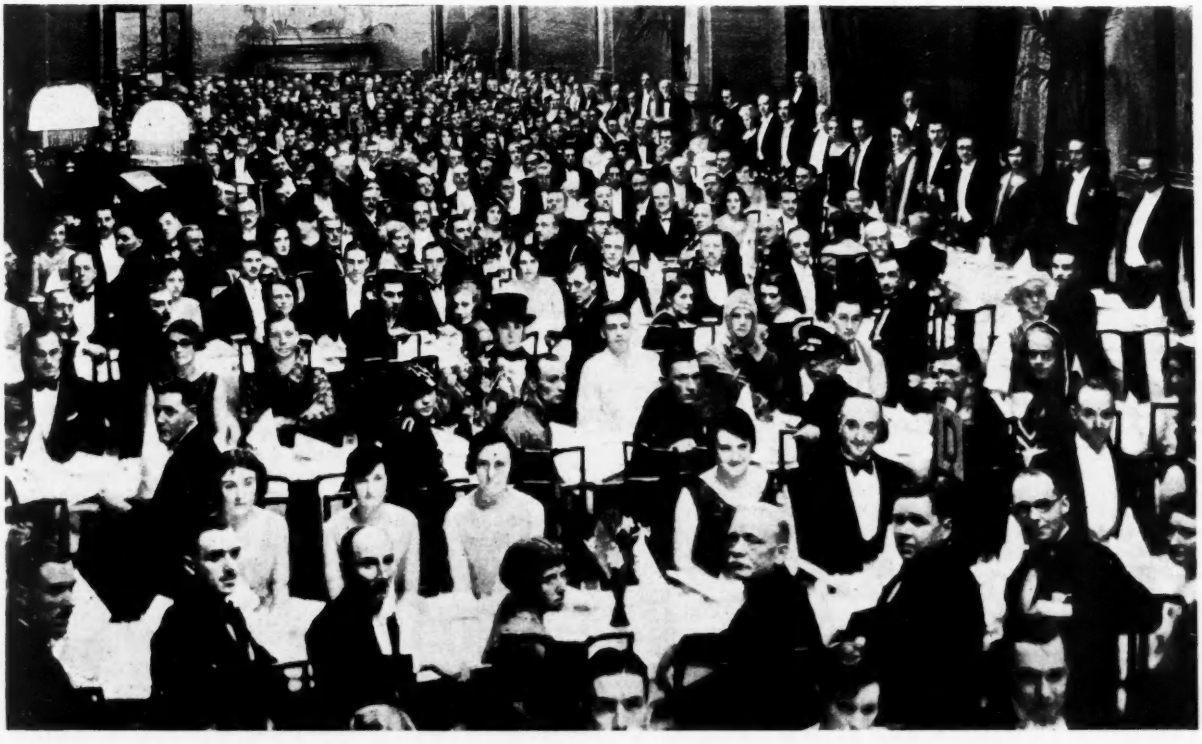
The toast of "The Staff" was proposed in a delightfully humorous speech by Mr. John A. Benn, in which he recounted early personal reminiscences, and added to those of the Chairman a few points on the firm's characteristics. "Fifty years ago," he said, "my grandfather designed a trade mark for *The Cabinet Maker*. This drawing showed a carpenter and a draughtsman working side by side at a bench. Underneath were the words from Shakespeare, 'And they work in their shirt-sleeves, too, like myself.' His contention was that theory and practice must go together. That contention had been upheld for fifty years. We are in the remarkable position to-day of having fourteen editors and fourteen managers working under a single roof. That is an achievement of which every one of us can be justly proud. Here is a team of writers and business men in fourteen distinct trades, each with its own special problems and technicalities, which for expert knowledge it would be hard to beat anywhere else in the world."

The toast was responded to in the happiest terms by Mr. J. A. Knivett (*Hardware Trade Journal*) and Mr. T. Mortimore Sparks (*Timber Trades Journal*).

A delightful addition to the toast list was made by Mr. Wedgwood Benn, who rose to say a word on behalf of a body of which he was a proud member—the ex-members of the staff. It was 22 years ago, he remarked, amid much laughter, since he ceased to inflict active damage on the firm's journals. "We cannot," he said, "claim any part in this great enterprise as it exists to-day but we take a certain pride not only in its size and power, but in the reputation it holds—the best thing that every business contains."

The final toast was that of "The Chairman," which was proposed by Sir William Crawford, at whose invitation the large audience rose and sang "For he's a jolly good fellow."

During the evening a beautiful bouquet of primrose carnations was presented to Lady Benn by Mrs. Duck on behalf of the staff. The evening closed with dancing.



BENN BROTHERS' GUESTS AND STAFF AT THE WHARNCLIFFE ROOMS.

# Dr. Herbert Levinstein on "Chemical Disarmament"

## The Illusion of Prohibitive Treaties

*Dr. Herbert Levinstein (of Manchester), President of the Society of Chemical Industry, addressing the London Section of the Society in the Hall of the Institution of Mechanical Engineers, London, on Monday evening, February 3, dealt exhaustively with the subject of "Chemical Disarmament." He criticised the illusory character of treaty provisions against gas warfare, contended that the limitation of naval armaments increased the importance of the chemical arm, quoted figures to show that gases were less brutal and destructive of human life and property than shells, and pleaded for the prosecution of chemical warfare research.*

### International Disputes Inevitable

DR. LEVINSTEIN began by saying that, in the highly competitive system which dominated our white civilisation and was now invading the civilisation of the East, the struggle for power or wealth was the dominant motive both in business and in politics. That being the ethical basis, if he might so describe it, of our civilisation, international disputes were inevitable, and occasionally the disputes led to war. War might be said to be caused not by the evil nature of man but by the highly complex and competitive system of society which we had constructed. The Kellogg Pact renounced war as an instrument of international policy, yet since the end of the Great War not a single year had passed in which one or other of the white nations had not either used or threatened force. It was difficult to resist the conclusion that with the present organisation of society the possibility of fighting was never remote. This emphasised the importance, to those who valued our present civilisation, of strengthening the efforts of the League of Nations in making wars on a large scale less probable.

### Importance of the Chemical Arm

British chemists would do wrong in declining to examine where this nation stood in the matter of defence, particularly against chemical warfare aggression. President Wilson was the main author or inspirer of Clause 171 in the Treaty of Versailles, which forbade chemical warfare; yet, fresh from the drafting of this clause, he telegraphed to the Congress that although the United States would gladly join in a national disarmament programme, it would nevertheless be obvious prudence to make certain of the successful maintenance of many strong and well equipped chemical plants. If President Wilson thought this obvious prudence for the United States, we were not war-mongers or panic-mongers if we examined the problem for ourselves and pursued a similar course.

Disarmament, or rather the limitation of armaments, had been one of the main preoccupations of the League of Nations since it was set up, resulting in the conference now taking place on the limitation of naval armaments. The restriction of naval armaments, the limitation of the number and size of ships, was almost purely an economy measure, but limiting the size or number of battleships or ordnance did not necessarily make war less likely; on the contrary, by making it cheaper, in a sense it made it easier. In any case, decreasing the relative importance of ships or guns or man power was bound to increase the importance of any other arm, particularly the chemical arm.

### Illusory Prohibitions

Chemical warfare had in a kind of way been forbidden at Versailles, at Washington, and by the League of Nations at Geneva, and, indeed, ever since the Hague Convention of July 1899. His object was not to show that the prohibition was illogical, but if it could be proved to be ineffective, that was another matter, for to rely on ineffective prohibition might be as dangerous in the future as it was in the last war.

The Germans claimed that they did not break the letter of the Hague Convention of 1899 when in April 1915 they let loose a flood of chlorine over the British lines at the second battle of Ypres and made a gap eight miles wide in our line. In the terms of the Convention the contracting powers agreed to "abstain from the use of projectiles, the sole object of which is the diffusion of asphyxiating or deleterious gases." The gas in April 1915 was discharged not from projectiles but from cylinders, an important technical difference. Most, if not all, of the gas shells employed afterwards had a high explosive charge, and their object was not, therefore, "solely" the liberating of asphyxiating or deleterious gases. The loosing of that stream of chlorine on the Canadian and French Colonial troops created a gap through which the Germans might have poured had their General Staff really believed at that time in the efficiency of the chemical weapon.

This surprise attack showed the extreme danger of allowing ourselves to neglect defence against chemical warfare because we did not expect it owing to some inaccurate or indefinite form of words used in a treaty.

In article 171 of the Treaty of Versailles, intended to prohibit chemical warfare, there was a proviso at least as vague as that of 1899 forbidding in Germany the manufacture and importation of toxic gases and analogous liquids.

### Loopholes in the Geneva Protocol

What exactly did the Geneva Protocol of 1925, which Great Britain had promised to ratify, prohibit? It prohibited the use in war of asphyxiating, poisonous or other gases and of analogous liquids, materials or devices, but it did not prohibit the use of screening smokes. We, of all people, should be crazy to prohibit their use. Yet, in concentrated form, most of the smokes had deleterious effects on the human organism. No one could claim, for instance, that chlorosulphonic acid smoke, the Zeebrugge screen, was pleasant to breathe in high concentration. Those who used it in chemical works knew it to be a most unpleasant substance to handle. There was no screen smoke which was wholly non-deleterious, and if smoke screens were allowed and not defined or limited the rest of the prohibition lost its virtue.

Again, were tear gases to be regarded as coming within the ban? Many people would argue that these were not poisonous for in very low concentration they only affected the eyes. If tear gas were prohibited, that would prohibit in war the use of a weapon permitted and used in peace. Tear gas was used in the United States for dealing with riots and similar disturbances and as a protection to banks and safe deposits against burglars and thieves. If it were permissible to use tear gas in peace time against one's own citizens, how could it be wrong to use it in war against the enemy?

High explosive shells, again, generally produced poisonous fumes which, under certain conditions, would poison men in the neighbourhood of the burst. The Geneva Protocol did not prohibit the use of high explosive shells that released poisonous fumes, nor did it define in any way what high explosives were permitted in war. The Protocol was certainly inaccurate in stating that the use of chemicals in war had been justly condemned by the general opinion of the world.

### More Humane than Explosives

Comparing the results of gas with those of artillery, Dr. Levinstein said that the casualties of the last war showed that the military results desired could be obtained more easily and with less human suffering from gas than from high explosives. Gas maimed or killed a much smaller proportion of those it put out of action than any other weapon used in the war. In proportion to the military results, it caused far less human suffering, temporary or permanent. From January 1 to September 30, 1918, the number of German gas casualties was, in round figures, 58,000; of those only 3 per cent. died. From August 1 to 10, 1918, the French had 14,578 gas casualties; of those 2·9 per cent. died. The total British casualties and deaths from gas from September 15, 1918, to the end of the war were 24,363 casualties, 540 deaths, percentage of deaths 2·2. Of the American gas casualties less than 2 per cent. died and very few were permanently injured. Out of every 100 casualties from all forms of warfare other than gas more than 25 died, and of those that survived 2 to 5 were maimed, blinded or disfigured for life. It was estimated that mustard gas killed one man for every 40 put out of action, while shells killed one for every three.

### Economy of Force

While not suggesting that gas warfare was anything but dreadful, it was less wasteful of human life and property than older forms of warfare, and it was of such outstanding importance that, when the time came, it would be used, even if such use were against the spirit of the Protocol. The persistent

products such as mustard gas permitted a great economy of force. No place sprinkled with mustard gas could be usefully held. Against high explosive shelling men could go underground and when the shelling ceased they could come up, but they could not come up and carry out any useful military movement if the surface had become contaminated by mustard gas. By means of mustard gas an army could protect its flanks against attack and an enemy could be denied territory which large numbers of troops would be required to defend. The use of mustard gas would also create a contaminated area just where an enemy was proposing to land troops or stores.

In the late war gas tactics were greatly developed. Research was divided into two parts, offensive and defensive. The main object of the one was to find a gas which would penetrate the enemy's mask and of the other to devise a gas mask that would protect against the enemy's lastest gas. Thus attack and defence marched step by step. As a new gas came out gas masks were improved to counter the new weapon. It was the old story of the struggle between the big gun and the armoured vessel. It seemed to him an elementary act of prudence for a nation situated as we were to see that research for chemical warfare should continue to be a subject for special study and that funds for this purpose should not be cut down below the safety point.

### The Real Reason for Clause 171

One of the objects of the Versailles Treaty was completely to disarm Germany, and it was pointed out at the time that Germany would not be disarmed by destroying her guns if she retained the Rhineland factories of the I.G. where had been manufactured the toxic products used by the German forces. To these factories there was at that time no adequate counter in France, Great Britain or the United States. The most striking feature, according to the Hartley report, was the fact that the bulk of the German plant employed for the production of poison gas had been in existence prior to the war for the manufacture of dyestuffs or pharmaceutical products. How were the Allied Peace Missions to deal with chemical disarmament in such conditions? Were they to destroy these works, to supervise or to control them for a period of years? They simply decided to prohibit the use of these products, thereby finding a solution which probably was no solution at all. That, he suggested, was the real reason for Clause 171 in the Treaty of Versailles.

### Increased Value of Chemical Weapon

What, finally, would be the effect of the limitation of other armaments on the value of the chemical weapon? At the outbreak of war the first anxiety would be to increase these restricted weapons as rapidly as possible. There were ways of using gas that could be adopted very quickly without guns and without shells. There were large stocks of gas cylinders ... once available in all countries where there was an alkali industry. Containers suitable for mustard gas, of simple design, fitted with some bursting arrangement could be quickly constructed. They could be thrown by hand from aircraft, tanks, armoured cars, and other vehicles, or from projectors. Commercial aircraft could be turned into machines for carrying and dropping bombs or improvised containers within 24 hours. No one could deny that to saturate arsenals, dockyards, ordnance dumps and so on behind the lines with mustard gas in a war of movement would be effective. He did not assume that the enemy would use mustard gas. It might well be something new and surprising which might break down our gas defence unless we were alert. In war, as the elder Moltke said, " there are usually three courses open to the enemy and he invariably chooses the fourth."

It seemed, therefore, that the limitation of armaments as proposed might greatly increase the military importance of the chemical weapon. The raw materials, the intermediates and the plant used for all important gases, were the same or similar to those employed in the manufacture of dyestuff intermediates or dyestuffs. Mustard gas was made by the Germans in the late war by the elegant ethylene chlorhydrin method. Ethylene chlorhydrin was now manufactured in this country; it was easily converted into thiodiglycol which could be quickly converted into mustard gas. Thiodiglycol had not found, as far as he knew, any important commercial application, though attempts had not been wanting so to do. It was a very innocent and convenient way of storing mustard gas, being harmless.

### Importance of the Chemical Industry

All these considerations, Dr. Levinstein finally contended, conclusively proved that it was prudent in peace time for the War Office to be in contact with the chemical industries. If an emergency occurred it would occur quickly. An improvisation of war material might be a matter vital to our existence. Chemical warfare materials might prove the quickest to improvise as well as the most effective. In these circumstances it was satisfactory to know that the chemical industry was our one great industry which had emerged from the war both absolutely and relatively stronger than before, with greater capacity for both production and research. For this we could be grateful to its leaders, for properly used and wisely directed it gave us, and perhaps not ourselves alone, security and strength.

## Points from the Discussion

Professor G. T. Morgan, who presided, remarked that Dr. Levinstein had performed a public service in dealing with such logical ruthlessness with the futilities of international law. He referred to Dr. Levinstein's double qualification for the post of president of the society. He had deputised last year for an American president, and he was also the son of a distinguished former president. On the attitude sometimes adopted towards International Law and Conventions, Professor Morgan recounted a story of his first Chinese student, who was one of four sent out by the Empress to study in Europe. Three of them went to the Continent to study International Law, and the fourth, asked why he had not done the same, instead of taking science, replied " China strong, don't want International Law. China weak, International Law no good. I no study International Law."

Brigadier-General Sir Marriott Smith disagreed with Dr. Levinstein's contention that gas in its various forms had usurped the practical usefulness of high explosive warfare. It was, however, after high explosives the most useful subsidiary weapon that " enabled us to impose our will on the enemy." He was, he explained, from his position as a servant of the Government unable to discuss the problem, but even though gas warfare by the Geneva Protocol was debarred, he felt that Dr. Levinstein had performed a valuable public service in clearing up so important and complicated a subject.

Mr. Davidson Pratt said that to the ordinary man the whole subject of chemical warfare was unintelligible. It was no good to refuse to face facts. The time would come when any nation which fancied its self-respect would have to fight. The question of disarmament had got to be considered very seriously. It might be that it would carry with it greater evils than those which it sought to prevent. Fighting with limited armaments meant a long war with, in the long run, more human suffering and a greater destruction of property. War was inhumane, but personally he felt that any weapon which finished war quickly was justifiable. Our chief safeguard against a chemical war was a strong chemical industry. During the last war it was always said that the principal reason which caused the Germans to refrain from dropping chemicals from the air was the fear of retaliation, and a live chemical industry was our best method of defence.

Professor Green, who was associated with Dr. Levinstein during the war in the manufacture of mustard gas, agreed with the paper without any reservations, and added that we were living in a fool's paradise if we believed in a system of prohibitions which could have no effect whatever.

Dr. Cullen, who frankly declared that he did not believe in the League of Nations " one little bit " referred to the activities of the United States in experimental chemical warfare. They looked at the whole question with different eyes. They made no secret of the result of their experiments, because they believed that a realisation of the appalling effects of chemical warfare would ultimately so influence public opinion that it would be abandoned.

Captain McGregor, United States assistant military attaché, and Mr. J. F. Ronca having also spoken, Dr. Levinstein, in conclusion, said that the general public relied on prohibitions. " You have only to analyse them as I did to see that they are not worth the paper they are written on. As the president of this great society, however, I thought it worth while to point out the rights and wrongs of the case—in case we have to go to war."

# Why Not Foreign Chemical Plant?

## British Chemical Plant Manufacturers Face a Thorny Problem

*At the annual dinner of the British Chemical Plant Manufacturers' Association in London on Thursday evening, January 30, the customary toast list was omitted and the evening was spent in a particularly frank and vigorous discussion of the question, "Why not Foreign Chemical Plant?" The result was an extremely interesting symposium, as the following report of the speeches shows.*

MR. J. A. REAVELL, the President of the Association, briefly explained that Mr. Horatio Ballantyne, who was well-known to many of them as either a friend or a foe, according to the side on which he appeared as an expert witness, had consented to open a discussion on a subject that concerned the whole chemical industry of this country, namely, "Why Not Foreign Chemical Plant?" As British chemical plant manufacturers they would like to hear his reasons, although they themselves knew quite well what the reasons were.

### Mr. Ballantyne States the Case

Mr. Ballantyne began by saying that the firm of Lever Brothers, with which he is associated, were looking forward to an increased amount of business and to increased points of contact with the chemical plant makers and with the chemical industries generally. As to the question to be discussed, he held no brief for the foreign manufacturer of chemical plant, but to be quite frank and honest there was much to be admired in the work of their foreign competitors. Those who had opportunities of visiting chemical works on the Continent would agree that, as regards the quality of the plant and the chemical engineering layout and so on, the continental manufacturers were second to none. It did British plant makers no harm to recognise that fact. The real answer to the question must be given by the members of that Association, but in considering it, it would be wise to divide chemical plant into three particular categories to which different considerations applied—first, the ordinary standard type of plant to which competitive conditions applied; secondly, speciality plant, which was either patented by the owners or a virtual monopoly of individual companies; thirdly, new forms of plant designed to meet particular requirements of the manufacturer.

### The All-Important Question of Cost

With regard to the first, there was no doubt that the all-important consideration was the question of cost. Users of plant could not overlook that factor, and he thought it would be agreed that in many respects this class of plant was produced more cheaply on the Continent than in this country. It did not follow that cheapness was the sole or dominant consideration as to whether we should import it, but if we compared the prices of British plant bought and delivered with the prices of similar plant bought and delivered on the Continent, the difference in price would be found to be striking. Members of that Association were already studying that problem very carefully, and no suggestions from an outsider were likely to assist them very much. He was struck very much by the warm way in which Colonel Pollitt last year recommended the pooling of resources and the amalgamation of small concerns, but apart from considerations of that kind there would always be a temptation to purchase foreign plant if the prices showed material difference.

### Speciality Plant

As to the second class of plant, it was hardly worth while putting the question, because it was not a question whether the plant should be foreign or home-made, but whether you should take it or not take it. He had observed what seemed to him a greater capacity on the part of the foreign maker of this type of plant to acquire inside knowledge of the needs and the business of the purchaser, and also greater readiness to take some risks in offering plant for trial and carrying out the work loyally during the period of trial. Possibly, there might be something for the British manufacturer to learn in that respect. In this type of plant, the American took the lead in automatic machinery and designs for production on a large scale, but apart from that the British and Continental firms stood very much on the same plane. Sometimes, it was difficult to get the purchaser to see the merits of a special plant; he might be slow to recognise its merits or to accept the assurances of the makers as to its capabilities. The maker required great patience and perseverance in dealing with that attitude of mind, and here, again, he thought that British manufacturers might have something to learn and might ask themselves what was the reason why the foreigner seemed sometimes to understand the business better than the home maker.

### The Question of Confidential Information

With regard to the third class, the question raised a delicate point as to the relations between manufacturer and purchaser in the matter of confidential information. There was no real guarantee of secrecy by the purchaser beyond the probity and character of the manufacturer, and in this respect the British manufacturer was pre-eminent. They could trust him not to give away their secrets and not to make use of the results of joint efforts in working out the plant. He did not know that the same could be said of the Continental maker, at least to the same extent.

Recently his firm had designs prepared for plant required by one of their companies and they sent detailed drawings to five different manufacturers on the Continent. Number one got the order in the course of a few months. The day after he got their business, he applied for a patent, and the specification proved to be an exact copy of their particulars. When the repeat orders came to be due it was pointed out that his patent was valueless because the whole substance of the specification had been previously disclosed by the firm to his four competitors.

That incident did not describe foreign manufacturers in general, but it did make purchasers in this country a little more careful and might turn the scale in favour of the home maker, where new ideas had to be incorporated. His advice to purchasers was—give as clear a description as possible to begin with, and when the plant was being tried out leave a reasonable margin for the manufacturer to get over the difficulties that usually cropped up. Recently his company made a complete inventory of the plant in their factories throughout the world, including those commoner types of plant to which he had referred, and they found a substantial predominance of the plant to be of British origin. So far as his company were concerned they would be glad to see the proportion increased, and they were disposed to give the most careful and sympathetic consideration to any propositions in regard to any special plant that might seem to be of use for their purposes.

### Dr. Levinstein Notes Progress

Dr. Levinstein stated that for years past he had been giving large orders for chemical plant of one kind or another, and he was glad to say that most of it, if not all, was British. There had been an enormous advance in the design of chemical plant and in the character of the manufacturers of chemical plant since the war. This had been one of the powerful factors in the recent development of chemical industry in this country. In his earlier days the chief engineer was usually the kind of fellow who found it very difficult to keep steam up with any coal except that from the particular colliery that he fancied. From conditions in those days there had been a complete transformation in the resources and atmosphere of the industry and in the calibre and character of the men who were now running chemical plants in this country.

Speaking of the question of delivery, he suggested that some better understanding should be arrived at as to reasonable periods for delivery. Too often it happened that those who promised most provided the least. The influence of the Association might be well exerted to establish some kind of ethical rule respecting delivery. He congratulated the Association on the great progress that had been made in recent years and on the courage with which they were facing their problems.

### Support the British Maker

Mr. F. C. Fairholme (Thos. Firth and Sons, Ltd.), who described himself as representing the raw products of chemical engineering, emphasised Dr. Levinstein's remark concerning the changed conditions of the industry and the totally different

point of view from which the question of foreign plant was looked at since the war. Was not that change of attitude an argument for encouraging the British Chemical Plant Manufacturers in their efforts to improve and organise the British industry? In such minor matters as laboratory glassware, we were dependent upon the foreign manufacturer for our supplies before the war, and when war broke out we realised our sense of dependence as we had never done before. Sheffield University had undertaken some very valuable research into glassware and had been able to assist British manufacturers of chemical glassware to produce an article that to-day was really better than that produced by the foreigner. Was not that an argument for encouraging the home manufacturer of chemical plant?

The question of purchase of foreign plant was a general problem and an extremely difficult one. He thought the prospective purchaser should give to the home maker an opportunity of ascertaining whether the foreign production was better than his own. He suggested, further, more co-operation in this country in order that the suppliers of materials for plant might have an opportunity of knowing exactly what was wanted and what the conditions were that the plant had to meet. It had always been very difficult to ascertain this information and it was difficult still. Such co-operation led to opportunities for the research that was so necessary and he was glad to find the attitude of the British chemical plant makers favourable to this idea. Research, of course, cost money, and, unless associated with an opportunity of manufacture on a scale that justified that cost from the financial point of view, research in this country would be bound to suffer. The real test that the home purchaser should put to himself was whether by purchasing foreign plant he was going to contribute to the establishment and progress of the home industry. He certainly suggested that that should be the measure or standard by which the problem ought to be judged.

### Is British Plant Too Good?

Dr. E. F. Armstrong remarked that he was present representing Dr. Clayton, chairman of the Association of British Chemical Manufacturers, who was travelling abroad. He was sure the advice of Dr. Clayton would be "Thou shalt buy nothing but British Chemical Plant," and no doubt all the members of their Association would support that view. For some years past he had had the control of a very considerable expenditure on plant and in that period he had travelled about extensively in search of the latest and soundest types of chemical plant. Between the years 1920 and 1925 a factory was built which had a 90 per cent. proportion of British chemical plant in it, and although some years had passed since the plant was completed it was still regarded as five or six years ahead in that particular field. He regarded that as a great achievement for British chemical plant. Its success was explained by the fact that they took trouble to travel about and see things, and, secondly, because they talked the scheme over with the chemical plant manufacturer in England and found him willing and responsive.

Conditions in the chemical industry had changed very greatly in recent years and those responsible for chemical plant had often to make very quick decisions. In that case there were two factors—the price factor as against patriotism, and the delivery factor. As to delivery, the whole point was to get a really honest delivery. His experience was that you were more likely to get an honest delivery from a British than from a foreign firm.

A point he had often wondered about was whether the plant of British makers was not sometimes too good, just as it might be a question whether the foreign plant was not too flimsy. The disadvantage of making the plant too good was that it became non-economic long after it ought to be scrapped. It was a question which was better—to purchase plant at a lower price that would last for, say, ten years, or to build a plant with the idea that it would last for ever? One of the reasons he thought why the Americans were making so much progress was that they built their plants to last, say, five years, and were then prepared to scrap them. He thought that some larger measure of co-operation and standardisation might be to the advantage of both manufacturers and purchasers in this country. A general agreement not to attempt to make plant to last for ever and a movement towards greater standardisation were two points very well worth consideration.

### Rolls-Royce or Ford

Dr. H. J. Bush, who was introduced by the Chairman as his successor when his present term of office expired, said that they must give a certain measure of credit to the German plant makers for the ideas and practices they had developed, but that did not make it necessary to import foreign plant into this country, because he believed that we could produce chemical plant as good as that of any Continental rivals as regards workmanship and design. Perhaps in the manner in which our wares were presented to potential purchasers, Germany was a little ahead of us. Their specifications were extremely elaborate and possibly might give a purchaser the idea that he was buying a Rolls-Royce when he was really getting a Ford. Perhaps we were more inclined to urge the purchaser to go in for a Rolls-Royce when a Ford would really do the job. That was a national characteristic, a national bias in favour of the highest possible quality, but it should be remembered that in this country we had to comply with very stringent Government Regulations from which the foreigner was exempt, and this made the British manufacturer more careful of the quality of his product. Given an equal chance, they had no reason at all to fear comparison with their Continental rivals, but he was afraid that for various reasons the British maker did not always have a level start.

### Causes of Delayed Delivery

Mr. W. J. Coles attributed the misunderstandings in regard to delivery to modifications of the original specifications often made by the purchaser; all those variations delayed delivery and made the final result a little more uncertain. As to the important point of respecting confidential information, he was confident that the British manufacturer was not in the habit of divulging such information, but he was justified in one grouse against the purchaser. When he applied for information as to how the plant was working he very often could not get a really satisfactory account, but he had known cases in which the British user on the other hand had given the foreign competitive firm complete technical information that he would not give to the English maker. This was a matter in which the British manufacturer had a just claim to fairer treatment.

### "Take Us Into Your Confidence"

Mr. W. B. Pickering (Hadfields, Ltd.) said that if they wanted a good plant and wanted to keep a design, etc., confidential, they could not do better than go to a British manufacturer. The latter's attitude might be summed up "Take us into your confidence; tell us what you want, and we will do our best to deliver the goods."

### Dr. Eyre's American Experiences

Dr. Vargas Eyre, who had recently with Dr. Armstrong been investigating plant in America, said there was no doubt whatever that if there was anyone who could safely be trusted it was the British chemical plant manufacturer. But he sometimes wondered whether it was necessary for the plant made in this country to be so robust and perfect in every part as the British maker tried to make it. In most plants they would find that there was some point where the work required to be of the very best on account of corrosive or other effects, but was it necessary to insist on the same standard of robustness in the parts that were not subject to anything like the same strain? He thought that on the question of cost, it might help if, while concentrating on the essential parts of a plant, they made the other less essential parts of a rather cheaper quality. He thoroughly supported the plea for increased contact and co-operation between users and makers and the claim that British chemical manufacturers should be given full facilities to understand the job which any particular plant was required to perform.

### Mr. Reavell Sums Up

The discussion was brought to a close by a very frank and vigorous summing up by the Chairman, in which he warmly asserted the claims of British plant makers. He accepted the post of chairman of that Association, he said, because he thought that it deserved support and that British makers should co-operate together in their common interests. When he handed the chair over to Dr. Bush, he would be leaving the Association increased in membership and increased in influence because they had pulled together. They would agree that the discussion that evening had been thor-

oughly worth while. It had done something to destroy the persistent worship of the foreigner.

To begin with, he would like to ask why foreigners could get so much better terms of payment from chemical manufacturers than British makers could. The usual conditions of plant manufacturers abroad were 30 or 50 per cent. with the order and the balance against shipment. In this country the terms for contracts of any size were 80 per cent. against delivery, 10 per cent. on erection, and the balance on starting up. He himself had had to advise on the alterations and adjustment of installations which had been a complete failure, and which had been built abroad. The makers had received full payment and nothing could be done.

### Why British Firms Cannot Take Risks

Attention had been drawn to the fact that British makers insisted on a very high standard of production. The reply to this was that plant manufacturers in England had to work under much more stringent regulations than manufacturers abroad for two reasons :—First, it was customary in England to manufacture all plant to the satisfaction of one of the well-known boiler insurance companies, who inspected the work during construction. Secondly, when a plant was delivered and if an explosion took place, whereby anyone was killed, a Board of Trade inquiry was held. They might have seen a case recently in the papers where, after a Board of Trade inquiry, an English concern was fined some £600, the money being in the form of fines on the engineer and others concerned. He believed there was actually a record of an explosion in a works where the manging director, the works manager, and the foreman in the boiler shop were all fined after one of those inquiries. In the case of a foreign firm they were not subject either to the insurance company's specification or to any fines by the Board of Trade, who had no hold over them in any way. This was an extremely important point where vessels were constructed working under very high pressures and temperatures. To use an everyday expression, the foreigner " gets away with it " while the British manufacturer would not, even if he could.

### The Question of Cost

Mr. Ballantyne had spoken of the all-important question of cost. On this point he would ask—what about wages ? His own company, having a sister company operating on the Continent, had the opportunity of comparing the question of prices and costs, and it was clear that the Continental manufacturer had an advantage over them on two counts : one was that his labour costs were not as high ; the other was that his " on costs " were not as high, as he had not got the large charges that had to be paid in any business owing to our so-called social services. The question of wages was an important item in competition with the Continent, as they all very well knew. In this country we had to pay millions to keep people who would not work, and that item had to go on to the costs of business firms.

### Respecting Confidence

Mention had been made of the importance of respecting confidence. The plant manufacturer had many difficulties to contend with. One was that it was impossible to patent everything and users asked for more and more details, both technical details on which the calculations for the plant were based and details of construction. The result was that they were frequently in possession of information which enabled them to construct plant themselves, and consequently at a lower cost.

Recently his company had spent a considerable sum of money in connection with the running of experiments and testing out apparatus for the calcining of a number of products. It was a form of calciner that could not be patented, but the details of its construction and method of operation made all the difference between success and failure. The firm in question obtained more and more details concerning both drawings and method of operating until they had in their possession sufficient information to go to a manufacturer and construct it. Now, it was obvious that the " on costs " of any plant manufacturer must include his experimenting costs in whatever way he divided them, and whereas the firm in question would never have attempted to build a plant themselves straight off for the purpose for which they wanted it, they did not hesitate to use all the information necessary which had been procured at someone else's expense and then get the plant at a cheaper price.

He mentioned this as the other side to the oft-made statement that it was difficult for chemical manufacturers to tell plant makers all they would like to, for fear the information might be given to their competitors. He did not think that any reputable firm of chemical engineers would do this. In any case purchasers would be better treated in this country than they would be abroad.

### More Confidence Wanted

In buying foreign plant, particularly in process work, it was essential that the chemical manufacturer should give the plant maker considerable details of his requirements. Very often chemical manufacturers here said that they did not like to give the British plant maker information of their installations and would rather give it to a foreigner. The answer surely was that if they dealt with plant makers of repute here there was no likelihood of any information being abused, while, in addition, it was more advantageous to have a home firm to discuss matters with, because they were more easily available if anything should arise when the plant was in operation.

In conclusion, the Chairman said that he had spoken warmly because on many points his experience made him feel strongly. In pleading the claims of the home maker, he was not thinking of himself or of his own generation ; he was thinking of the young men who would have to uphold the industry in the future, and who were as good as any of the makers of Germany, France, Spain or America. " Believe me," he exclaimed, " we can lick them at the game, if you only give us the chance."

The Chairman's vigorous remarks were very warmly endorsed by those present.

### List of Members and Guests

The following is a list of the members and guests present in addition to the President (Mr. J. Arthur Reavell) and Dr. H. Levinstein (President of the Society of Chemical Industry) :—

E. A. Alliott (Manlove, Alliott and Co.), Dr. E. F. Armstrong (A.B.C.M.), H. Ballantyne (Lever Brothers, Ltd.), Booer (Reavell and Co.), B. L. and H. Broadbent (Thos. Broadbent), Dr. H. J. Bush (Huntington, Heberleins), Dr. F. H. Carr (British Drug Houses), W. J. Coles (Edgar Allen and Sons), H. W. Cremer (King's College), R. M. Drake (B.C.P.M.A.), Edwards (Macinlop, Ltd.), Dr. J. Vargas Eyre (Distillers Co.), F. C. Fairholme (Thos. Firth and Sons), G. Gray (Lever Brothers), A. E. Hatfield (Achille Serre), Dr. W. H. Hatfield (Thos. Firth and Sons), F. E. Hamer (THE CHEMICAL AGE), J. Hampson (Broughton Copper Works), L. Harral (Macinlop, Ltd.), H. N. S. Hartley (Reavell and Co.), D. M. Henshaw (W. C. Holmes and Co.), Professor J. W. Hinchley (Imperial College), A. J. Holden (B.C.P.M.A.), T. J. Horgan (Edgar Allen and Sons), J. Inglis (Joseph Crosfields), R. O. James (The Dorr Co.), W. T. Kipps (Joseph Crosfields), A. E. Knowles (International Electrolytic Co.), W. G. Mills (Mills Packard Co.), Dr. G. T. Morgan (Government Chemical Laboratory), P. Murphy (B.C.P.M.A.), A. E. Osborn (Macinlop, Ltd.), M. Perry (Baker Perkins), Dr. Pendred (*The Engineer*), W. B. Pickering (Hadfields), J. Davidson Pratt (Secretary, B.C.P.M.A.), R. L. Quertier (Reavell and Co.), E. A. Reavell (Kestner Evaporators), J. Rogers (I.C.I.), W. Russell (The Dorr Co.), C. J. Seaman (Brinjes and Goodwin), Dr. R. Seligman (Aluminium Plant and Vessel Co.), D. A. Siltzer (Broughton Copper Works), Dr. R. E. Slade, H. Talbot (Chairman, Chemical Engineering Group), S. J. Tungay (Mills Packard Co.), R. L. West (John Thompson, Dudley), G. S. Whitham (The War Office), J. A. Williams (Prodorite, Ltd.), J. W. Wilson (Aluminium Plant and Vessel Co.) and J. W. Wright (Cannon Iron Foundries).

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## Graesser-Monsanto Developments

MR. JOHN D. GILLIS, formerly assistant to the President of Monsanto Chemical Works, St. Louis, U.S.A., has been elected to the Board of Directors as Vice-Chairman of the English company, Graesser-Monsanto Chemical Works, Ltd. Mr. Gillis has long been connected with the chemical industry of America, and prior to joining this company, was president of John T. Milliken and Co. His experience will be useful to this rapidly expanding company, which has, in the last twelve months, given evidence of continual progress.

The company finding their accommodation insufficient for their increased staff, have moved to new offices at Victoria Station House, Victoria Street, London, S.W.1. Telephone, " Victoria 1535 " ; telegrams, " Graesanto-Sowest," London.

# Electro-Plating Research

### Dr. Rosenhain's Appeal to Industry

AN appeal to chemical industries to co-operate and bear their share of the cost of research work at present undertaken by the Government, was made by Dr. W. Rosenhain, F.R.S., of the National Research Laboratory, Teddington, in the course of a stimulating address on "Research and Practice" at an exhibition and convention of the Electroplaters' and Depositors' Technical Society, held at the Northampton Polytechnic Institute, London, on Friday, January 31. Dr. R. S. Hutton, President of the Society, was in the chair, and in introducing the speaker, referred to his valued work as chairman of the Government Committee of Research on Electrical Deposition.

Unlike other branches of metallurgy which had been practised from the earliest times, said Dr. Rosenhain, electroplating was based entirely on the results of scientific discovery. As evidence of the speed of modern developments, he referred to the article on the subject in the eleventh edition of the *Encyclopedia Britannica* presented to him in the later years of his own university studies. The writer referred to the possibility of using power-driven machines to generate current, and suggested they might be superior to batteries, but he uttered a grave warning against the then new method of obtaining copper by electrolysis.

### Growing Away from Scientific Discovery

A danger with industries was that they tended to grow away from the first scientific discovery on which they were based. Processes were made cheaper and more practical, but new difficulties arose, and it became hard to trace the cause of troubles. Industry was in a bad position to make experiments, and ordinary methods of trial and error were too costly. Generally it was prepared to support research if it could be assured of getting just what it wanted; but to attack an individual problem was not the true method of research. If a specific problem was to be dealt with, as much care should be taken in the selection of the problem as in the selection of the investigator. Deprecating the volume of *ad hoc* scientific research that was being done, Dr. Rosenhain said he had known many a good man to have his scientific heart broken by being set impossible problems, and he had had experience of them himself. Sometimes they involved a vast amount of general research and the spending of large sums of money.

Co-operative investigation, pooling of laboratories and the pooling of information on kindred problems were necessary for industrial research. There must be freedom for the investigator to follow up side discoveries which were often more important than the specific, as in the case quoted by Sir Oliver Lodge in his address in May last to the Institute of Metals, of the Cambridge investigator who missed the discovery of X-rays. Problems were put in their simplest form in the laboratory, they were dealt with economically, and under exact conditions impossible in works. It was sometimes complained that processes were different in a laboratory. That was its great merit, for there it was possible to vary one factor at a time.

### Attack on Plating Problems

Among the chief electro-plating problems which were the subject of research at present, were "pinholing" in nickel deposits, securing proper adhesion of the deposit, or preventing adhesion, stress effects and protection from corrosion. Although its report was not yet published, he could state that these were being successfully attacked by the Government Electro-Deposition Research Committee, and among its notable achievements had been, not merely the discovery, but also the cure, of the weakness brought about in metals by plating. Promising results were expected, too, from experiments being carried out with cadmium and zinc, especially the former. All this research, however, cost a great deal of money—the annual cost of metallurgical research, including that on electrical deposition was £100,000—and it was only fair that industries which derived benefit from it should pay their share of the cost and not leave it to be borne by the taxpayer.

Replying to a vote of thanks, moved by Mr. V. R. Evans and seconded by Mr. D. J. MacNaughton, Dr. Rosenhain said it took ten or twelve years before a laboratory discovery had an industrial application. That was ten years too long and ten years longer than it would take in the United States or Germany.

### The Exhibition

Chromium plating was the chief topic of the Convention, and an evening discussion on the present position of the industry was preceded by a motor coach visit to the premises of J. Vince and Co., Ltd., Whippet Works, Clapham Common, where a £2,000 plant is in course of erection. Details of the plant were explained to the party and the methods adopted for dealing with fumes and spray.

An interesting display at the exhibition was made by the Woolwich Research Department who, besides numerous examples of deposition effects showing "pinholing" and its causes, had an apparatus for viewing the cathode during deposition. The British Metallising Co., Ltd., showed a great variety of deposition on non-conductors, including silver on vulcanite and chromium on canvas. The Royal Aircraft Establishment, Farnborough, had several exhibits, and there were displays by a number of well-known firms illustrating methods of applying chromium and other plating for the motor industry, domestic articles, musical instruments and architectural purposes. A transparent sheet of gold ·00002 mm. thick, also attracted considerable attention.

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# Distinguished Scientist's Appointment

### Sir H. Hartley Director of Research to the L.M.S.

THE board of the London, Midland and Scottish Railway Co. has appointed Sir Harold Hartley, C.B.E., F.R.S., to be a vice-president, in succession to the late Mr. R. W. Reid, C.B.E., and also director of scientific research. Sir Harold Hartley has been a Fellow and Tutor of Balliol College, Oxford, since 1901, and is Bedford Lecturer on Physical Chemistry. During the war he took a prominent part in the direction and administration of the Gas Services in France, and was Controller of the Chemical Warfare Department of the Ministry of Munitions in 1918–19. He was awarded the M.C., was thrice mentioned in despatches, and became a Brigadier-General.

Sir Harold was head of the mission which reported on the German chemical factories in 1919. He is a member of the Fuel Research Board, and since 1922 has been a director of the Gas Light and Coke Co., and a member of the Works and Works Supervision Committee.

This appointment, following the recent appointments to the staff of the Bank of England, of which Sir Josiah Stamp, chairman of the London, Midland and Scottish Railway, is a director, is of particular interest as yet another sign of the readiness of both finance and industry to invoke the aid of the man of science. The appointment of Sir Harold Hartley as vice-president for the technical departments of the railway would seem to imply that it contemplates important developments in scientific research as applied to transport problems.

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### Notebook of Early Manchester Chemist

VALUABLE facts about the work of Dr. W. Henry, the Manchester chemist, and a friend of John Dalton, have come to light by the discovery of one of his old notebooks, which was recently saved from destruction by a furnace attendant at the works of A. and S. Henry and Co., Ltd., of Manchester, who found it among some litter he had been instructed to burn. A paper on the subject was given at a meeting of the Literary and Philosophical Society, Manchester, on Tuesday night, by Mr. W. Buckley. The notebook contains many of the laboratory records of experiments which Dr. Henry described in a paper read in 1818, entitled "Experiments on gas from coal, chiefly with a view to its practical application." The doctor was frequently asked his opinion on points about the manufacture and use of coal gas at the mills, and several of the entries in the notebook relate to the difficulties that arose and his experiments in connection with them. Among the final entries, which concerned experiments to be carried out at a later date, is one suggesting the use of finely divided platinum for the analysis of gases by preferential combustion.

## Nobel Laureates Honoured

### Britain's Post-War Successes in Science

SIR CHARLES J. MARTIN, on Monday, presided at a dinner which the Biochemical Society gave, at the Hotel Victoria, London, in honour of the four Nobel Laureates in chemistry and medicine, 1929, Professor C. Eijkman, Professor Sir Frederick Gowland Hopkins, F.R.S., Professor Hans von Euler and Professor Arthur Harden, F.R.S. All were present except Professor Eijkman, who, because of advancing years and ill-health, was unable to undertake the journey from Utrecht.

Forty years ago, Sir Charles said, the Dutch Government appointed a commission to inquire into the disease of beriberi, and that commission recommended the institution of a pathological institution in Batavia. Professor Eijkman was appointed the first director. Next year a number of hens belonging to the laboratory sickened, became paralysed, and died. The professor found that these hens had been fed on boiled rice which was the refuse from the mess. Experimenting, he found that hens fed on decorticated rice became paralysed and wasted, while those fed on whole rice thrived. He found that there was something in the bran of the rice, removed in the process of decortication, which, if fed to the sick fowls, cured them. Professor Eijkman came to the conclusion that beriberi was the analogue of this disease in fowls, but it was not until twenty years afterwards that his knowledge thus gained was made use of.

Professor Sir Frederick Gowland Hopkins, continued Sir Charles, had in forty years enriched physiology by his biochemistry, not least in regard to his researches into muscular activity.

The work of Professor Hans von Euler and Professor Arthur Harden had been very largely in the realm of alcoholic fermentation. Professor von Euler, was the most versatile discoverer he knew.

Replying to the toast of the guests, the Swedish Minister said that Dr. Alfred Nobel had given these prizes for those who had done the most for science, and the fact that last year Great Britain won no fewer than three of them was matter for the pessimists in this country to reflect upon. Before the war Germany had won thirty-two prizes and Great Britain twenty. Since the war Great Britain had won eleven, Germany nine, and France six. This was the more remarkable as, from the scientific point of view, England suffered relatively more than any other combatant.

### Index to British Standard Specifications

THE 1930 edition of the Index to British Standard Specifications has just been issued. It is a complete subject index, which, in view of the large number (378) of British Standard Specifications now available, some of which include provisions for several articles or materials, will be of much assistance to those purchasing engineering and allied material apparatus and machinery. A numerical list of the specifications is also included. The list, which covers 35 pages, shows the wide range of subjects covered by the British Standard Specifications and should be in the hands of all drawing offices and contracts departments of firms throughout the engineering and allied authorities who have found the British Standards of such benefit in the preparation of contracts. Copies are available from the Publications Department, British Engineering Standards Association, 28, Victoria Street, London, S.W.1., price 1s. 2d., post free. To assist in the wider adoption of the British Standard Specifications, the Association has taken accommodation at the British Industries Fair, Birmingham, (Stand 16 G 3), where copies will be available.

### Annual Report of the D.S.I.R.

THE report of the Department of Scientific and Industrial Research for the year 1928–29, which has just been issued, remarks on the growing interest taken by various sections of industry in its work. All the research organisations of the Department tell of increased requests for special investigations and co-operation and help from outside, and at the National Physical Laboratory tests and special investigations have exceeded the record for any previous year. The total expenditure for the year ended March 31, 1929, is £485,450, against £506,410 in the preceding year.

## Chemical Matters in Parliament

### Dead Sea Concession

COLONEL HOWATD-BURY (House of Commons, February 5), asked the Under Secretary of State for the Colonies whether on or about November 26, 1929, he received a telegram from the Arab Executive in Palestine objecting to the proposed signature of the formal agreement between the Crown Agents for the Colonies and Mr. Moses Novomeysky and Major Tulloch for the grant of the Dead Sea Salts Concession, on the ground that the agreement and concession were contrary to, and an evasion of, Article 11 of the Mandate; and what steps he had taken as a result of this communication.

Dr. Shiels said: I received the telegram from the Arab Executive to which the hon. member refers. As the hon. member is aware, the preliminary agreement for the grant of the Dead Sea Salts Concession to Messrs. Novomeysky and Tulloch was signed in May last. I see no ground for the contention that the concession was contrary to and an evasion of Article 11 of the Mandate. No action was taken as a result of the telegram.

### Low Temperature Carbonisation

Mr. Dickson (House of Commons, February 4), asked the Secretary for Mines whether a recent test had been made of the Turner coal plant at Coalburn; and, if so, when the report of the test would be available?

Mr. Turner stated that a test of the Turner low-temperature carbonisation plant was made last year, and a report dealing with this test would be published within the next fortnight. There had been some delay in publishing the report owing to the fact that a second test was to be carried out, but so far a suitable opportunity for its completion had not occurred.

### The B.I.F. at Olympia

INDUSTRIES which serve industry are to be well represented in the London section of the British Industries Fair at Olympia, from February 17 to 28, and there should be good opportunities for business between one section of exhibitors and another—an aspect of the Fair which is apt to escape notice. There will, of course, be a full exhibition of chemical exhibits as in past years. All stands other than those owned by exhibitors, or those of a special design or type, have been constructed with fascias of uniform depth and columns of uniform height and a distinctive colour scheme has been arranged for each section. Steps have also been taken to ensure a specially attractive appearance at each entrance.

Four entrances will be used—one in Addison Road, two in Hammersmith Road and one in Blythe Road. A covered-in steel bridge has been built to convey passengers from all platforms at Addison Road station into the forecourt of the Main Hall entrance, and road traffic using that entrance will approach it from Hammersmith Road and pass out the other way, the roadway having been continued under the new bridge. An official car park is provided near the Addison Road entrance.

The Duke of York will be the principal speaker at the Government's banquet to representative exhibitors and buyers at the Mansion House on February 17. The Foreign Secretary, Mr. Arthur Henderson, M.P., will preside and the Minister of Labour, Miss Bondfield, M.P., will also speak.

### Yugoslavian Imports of Lead and Zinc Pigments

IMPORTS of zinc oxide, litharge, and the group comprising white, red and yellow leads into Yugoslavia during 1928 totalled respectively 1,015,733 kilos, value 9,264,581 dinars; 233,599 kilos, value 2,080,665 dinars and 272,187 kilos, value 2,725,704 dinars. For zinc oxide, Czechoslovakia was the main source of supply, sending about 78 per cent. of the total importation. Other important countries were Poland, with approximately 9 per cent. and the Netherlands, furnishing about 7 per cent. Austria was the largest seller of litharge, shipping approximately 62 per cent. of the total quantity. Poland was next in importance represented to the extent of about 18 per cent. Austria was likewise the chief country of origin for imports of white, red and yellow leads, supplying about 91 per cent. with minor quantities forwarded by Italy, Czechoslovakia and France.

# From Week to Week

THE LONDON OFFICES of the British Oil and Cake Mills, Ltd., are now at Empire House, St. Martin's-le-Grand, E.C.1.

UNIVERSITY NEWS—*Oxford*: S. A. Bryant and G. Hadman have been elected to residential scholarships in Chemistry on the Casberd Foundation.

FATHER JULES PINTE, director of the Technical Institute of Roubaix, has been elected president of the Association of Chemists of the Textile Industry.

FIRE BROKE OUT in the dinitro-phenol building at the Pilkington-Sullivan Works, Widnes, last week, but, apart from the destruction of the wooden roof, relatively little damage was done.

ABSENCE OF TRADE fluctuations and an increasing flow of orders from abroad was referred to as one of the features of the firm's year at a dinner given to their employees by the directors of William Gardner and Sons, Ltd., of Gloucester.

A VERDICT OF "ACCIDENTAL DEATH" was recorded at an inquest at Kensington on Monday on a laboratory attendant at the Imperial College of Science, South Kensington, who was killed by falling 120 feet down a staircase well at the college.

A SPECIES OF SEAWEED known as "slock," which grows along the shores of Luce Bay, Wigtownshire, in the vicinity of Stairhaven, is, according to local reports, being collected and despatched to an industrial centre for the extraction of a dye.

A MERGER AGREEMENT has been signed by the directors of the American Chatillon Corporation and the Tubize Artificial Silk Co. of America. The shareholders of the two concerns will meet on March 5 and 6 respectively to approve the consolidation.

RUSSIAN ORDERS FOR METALS placed in Germany in the latter half of December include 1,070 tons of ferrosilicon, 60 tons of ferrotungsten, 384 tons of copper, 320 tons of lead, 2,000 kg. of bismuth, and 3,900 kg. of cobalt metals, as well as 250 tons of sheet zinc.

PROMPTED BY THE FREQUENCY of accidents in Cornish mines, William Bickford, of Tuckingmill, Camborne, produced the first coil of safety fuse for blasting in 1830, and, to mark the centenary, members of Camborne Urban Council last week paid an official visit to the works of Bickford, Smith and Co., Ltd.

THE U.S. FEDERAL APPEAL COURT has declared valid the "air nitrogen patent" of the Atmospheric Nitrogen Corporation (a subsidiary of the General Chemical Co. of New York), according to which the gases, before their entry into the catalyst chamber, are brought into contact with anhydrous liquid ammonia. The discoverer named is Fred W. De Jahn.

J. SAINSBURY, LTD., London, were fined £5 and two guineas cost at Kingston Borough Police Court, on January 29, for selling gorgonzola cheese containing a percentage of barytes with oxide of iron. It was stated that an Italian firm had offered to supply to the defendants cheese which would not continue to ripen on its journey to this country. The cheeses supplied, however, had rind containing the prohibited substance.

MR. EDMUND CARPENTER, Mr. H. W. Seymour Howard, and Dr. E. Leonard Leeds (all three directors of Hodders, Ltd.), have been offered and have accepted seats on the board of Heppells, Ltd., London. Mr. J. V. Elliott Taylor, Mr. R. Hough, and Mr. T. Wood have resigned. The financial year of the company closes on March 31, and at the earliest possible date thereafter the annual general meeting of shareholders will be convened.

THE ENGAGEMENT is announced of Mr. C. B. Woodley, general secretary of the British Association of Chemists, to Miss W. Wright. The engagement is one of much interest, since Miss Wright has been prominently connected with and has done excellent work for the Association as a member of Council, and as past chairman of the London Section. Mr. Woodley has rendered excellent service to the Association as general secretary, and will receive the congratulations of his fellow officers and members.

THE CANADIAN GOVERNMENT has accepted the tender of Robertson and Jarvin, Ltd., for work on the construction of the new building to be erected at Ottawa for the laboratories of the National Research Council. The estimated cost is $2,774,000, and work will be begun immediately after approval of the contract by the Cabinet, with provision for completion in fourteen months' time. The building will be of cut stone in a classical design of architecture, and is to be erected in Sussex Street on a site overlooking the Ottawa River.

THE ACADEMY OF SCIENCES of Paris has awarded its chemistry prizes as follows: The Montyon prize (unhealthy trades) to Daniel Florentin, for his work on the hygiene of large towns; the Jecker prize between Richard Fosse, for his work on agricultural, biological, and organic chemistry, and Marcel Sommelet, for the whole of his work in organic chemistry; the Cahors foundation between Henri Moureu, for his researches on the tautomerism of the *a*-diketones, and Raymond Quélet, for his work on certain derivatives of benzene; the Houzeau prize to André Travers, for his work in inorganic and analytical chemistry.

DR. F. BERGIUS has been succeeded as director of the Deutsche Bergin-A.-G. für Köhle-und Erdölchemie, Heidelberg, by F. Koch.

BRADFORD CORPORATION, it is announced, has decided to borrow £20,000 towards acquiring a supply of radium for use at St. Luke's General Hospital.

AT A MEETING of the Pharmaceutical Society on Wednesday, Dr. Addison unveiled a memorial to Sir William Glyn Jones, who was for ten years its secretary.

THE ZINC CORPORATION, LTD. (of Australia), has closed its roaster and acid plant. Sulphuric acid, which was made from the roasting process, will in future be obtained elsewhere.

"CHEMICAL FIRES: Their Causes and Preventions," was the title of an interesting address given by Captain Ralph D. Owen, to the last meeting of the South Wales Section of the Society of Chemical Industry.

A NEW BONEMEAL FACTORY ("Give og Omegns Kod-Benmels-Fabrik") has been established recently at Give, Jutland, Denmark. The Company has a capital of 80,000 crowns and will shortly commence operations.

THE MINISTER OF HEALTH has appointed Mr. C. Bride, M.A., B.Sc., A.I.C., to be an inspector under the Alkali, etc., Works Regulation Act, 1906. He has been assigned to the district with headquarters in London.

IT IS REPORTED that as the result of representations made by the Chemists Club and the American Institute of Chemists, salary increases amounting to 66,000 dollars have been granted to the 130 chemists employed by the City of New York.

LOW TEMPERATURE CARBONISATION plant in existence in South Africa is stated by the Director of Fuel Research to have a capacity of well over 1,000 tons a day, and further plant with a nominal capacity of over 6,000 tons a day is in course of erection.

BY A RECENT ORDER of the Australian Commonwealth Department of Trade and Customs, artificial silk goods may, for the purpose of compliance with the Commerce (Trade Descriptions) Act, be described as "artificial" or as "rayon," a term not previously permitted.

THE CHEMICAL AND METALLURGICAL CORPORATION, LTD., of Runcorn, announce that their sole selling agency is now held by Bush, Beach and Gent, Ltd., Marlow House, Lloyd's Avenue, London, E.C., in conjunction with Frank Segner and Co., Ltd., 21, Spring Gardens, Manchester.

THE PRODUCTION OF BARYTES in Canada during 1928 amounted to 127 tons, valued at $2,847, as compared with 56 tons worth $1,268 in 1927. The 1928 production was obtained from the Johnson mine at Lake Ainslie, Inverness County, Nova Scotia. Imports of barytes into Canada during the period under review totalled 2,878 tons, valued at $58,710.

A FINE OF £20 was imposed at Greenock this week on John E. Duigenan for selling a liquid named "Raycar," a polish said to be particularly good for surgical instruments, and falsely representing it to be the product of Imperial Chemical Industries, Ltd. The liquid concerned, instead of being manufactured by any branch of I.C.I., was stated to have been made for the defendant by a London firm.

## Obituary

PROFESSOR CHARLES S. DOGGETT, of the Textile Chemistry Department, Clemson College, U.S.A.

DR. RICHARD PHILIPPI, of I.G. Farbenindustrie Aktiengesellschaft and I.G. Dyestuffs, Ltd., on January 30, at Frankfurt-am-Main.

DR. BERTHOLD WUTH, of Badenweiler, Germany, for many years associated with the American Ciba Co., and widely recognised as a leading authority on textile chemistry.

MR. K. B. MAVLANKAR, principal of K. B. Mavlankar, dealers in essential oils, etc., of 40 Hatton Garden, London, on Saturday, February 1. The funeral took place on Tuesday at the Golders Green Crematorium.

## Books Received

DIZIONARIO DI MERCEOLOGIA E DI CHIMICA APPLICATA. VOL. II. DAMIANA-MUSSENA. By Prof. Dott. G. Vittorio Villavecchia. Milan: Ulrico Hoepli. Pp. 1096. L.60.

THE CONDUCTIVITY OF SOLUTIONS. By Cecil W. Davies. London: Chapman and Hall. Pp. 204. 15s.

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH REPORT FOR 1928–29. London: H.M. Stationery Office. Pp. 200. 3s. 6d.

THE SOYA BEAN AND THE NEW SOYA FLOUR. By C. J. Ferrée. London: William Heinemann. Pp. 78. 6s.

SULPHURIC ACID AND ITS MANUFACTURE. By H. A. Auden. London: Longmans, Green and Co., Ltd. Pp. 231. 16s.

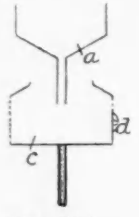
# Patent Literature

*The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.*

### Abstracts of Accepted Specifications

322,424. MANURES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, September 21, 1928.

A mixture of diammonium phosphate and ammonium nitrate is melted and sprayed at 108° C., the drops being




322,424

solidified by cooling to 92° C. In another case, a mixture of potassium chloride, ammonium nitrate, and diammonium phosphate is used. The first two are mixed at 135° C., and phosphate added at 105° C. The mixture is then sprayed and sets at 80° C. in the form of small globular particles. The materials may be mixed in a heated chamber *a* and the melt then run into a receptacle *c* provided with peripheral apertures *d* and rotating at high speed. The melt is sprayed by centrifugal force. In another apparatus, the melt may be sprayed from the edge of rotating curved discs. In another case, the vessel *c* is stationary but is provided with a rotating bottom spaced from the walls to allow the melt to escape.

322,427. OBTAINING BODIES IN A FINELY DIVIDED FORM. Nobel Industries, Ltd., Nobel House, Buckingham Gate, London. From E. I. Du Pont de Nemours and Co., Wilmington, Del., U.S.A. Application date, June 1, 1928.

The process is for obtaining in finely divided form substances such as nitro-guanidine, *p*-nitraniline, etc., which are insoluble at a low temperature, and substantially soluble at a higher temperature which is below the point of rapid decomposition. An aqueous solution is formed at the higher temperature, *e.g.*, 140°–160° C., under increased pressure in an autoclave, the concentration being greater than the saturation at the lower temperature. This solution is discharged into a mixture of ice and water in such amounts that it is cooled instantaneously to 0° C.

322,429. WETTING AND EMULSIFYING AGENTS AND SOAPS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, July 27, 1928.

These substances are obtained by mixing wholly or partly saponified crude oxidation products of paraffin wax with water-soluble salts in such proportions that no water insoluble salts are formed in aqueous emulsions. The water-soluble salts should not be alkaline unless the acid constituents form colloidal solutions with water. Suitable salts include sodium chloride, sodium sulphate, magnesium chloride, alkali silicates, aluminates, or stannates.

322,437 FATTY ACIDS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, August 30, 1928.

The crude oxidation products of paraffin and other waxes, containing hydroxy carboxylic acids, are distilled to obtain unsaturated long chain fatty acids. Catalysts such as red phosphorus, sulphuric acid, or metal oxides may be used. The distillation may be at reduced or atmospheric pressure, and at such temperature that the unsaturated acids collect in the distillate. Thus, the oxidation products from hard paraffin wax, montan wax, bees wax, or ozokerite, may be distilled in vacuo at 110°–280° C. and the distillate redistilled in an atmosphere of carbon dioxide. The fatty acids obtained may be hydrogenated to saturated acids for the production of solid edible fats.

322,445. HYDRO AROMATIC HYDROCARBONS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, September 3, 1928.

Aromatic hydrocarbons are treated with hydrogen under pressure at a temperature above 350° C. in the presence of catalysts immune from sulphur poisoning. The catalysts employed are those described in a large number of earlier specifications.

322,463. DYEING CELLULOSE ESTERS AND ETHERS. British Celanese, Ltd., 22, Hanover Square, London. G. H. Ellis, H. C. Olpin, and E. W. Kirk, of British Celanese, Spondon, near Derby. Application date, August 1, 1928.

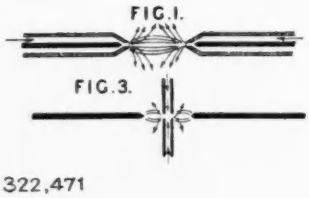
Cellulose esters and ethers are dyed by applying in solution, colloidal solution, or aqueous suspension, with or without dispersators and/or protective colloids, N-arylated nitrogen derivatives of benzo-or naphtho-quinones, *i.e.*, benzo-or naphtho-quinones mono- or di-imides or amino substituted benzo or naphtho-quinones arylated in an imino or amino group, except indophenols. Examples are given of the dyeing of cellulose acetate with dispersed 2-(*p*-aminophenyl-amino)–1:4-naphthoquinone, dispersed 1-imino-2-hydroxy-4-*p*-tolyl-imino-naphthalene, 2:5-di-(phenyl-amino)-benzo-quinone, 2:5-di-(*p*-amino-phenyl-amino)-benzo-quinone, 2:5-di-(*p*-dimethylamino-phenyl-amino)-benzoquinone, 2-5-di-(phenylamino)-3:6-dichlor-benzoquinone, 2-*p*-anisidino-1:4-naphthoquinone, and 1-imino-2-hydroxy-4-($4^1$-aminophenyl-imino)-naphthalene.

322,466. COATING COMPOSITIONS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, June 2, 1928.

These compositions consist of nitro-cellulose and soluble resinous condensation products of aliphatic di-basic acids with poly-hydric alcohols. Suitable resins are those obtained from succinic, maleic, adipic, oxalic, or di-glycollic acids, and glycerol, glycols, sorbitol, penta-erythritol, or their hydroxy-alkyl ethers, *e.g.*, glycerol-dihydroxy-ethyl-ether, $CH_2(OC_2H_4OH)$–$CH(OC_2H_4OH)$–$CH_2OH$. Various colouring materials, fillers, solvents, cellulose esters of alphatic carboxylic acids, softeners, and artificial resins may also be added. In an example, nitro-cellulose, a condensation product of succinic acid and glycerol, and tricresyl phosphate are dissolved in ethylene glycol mono-ethyl ether, ethyl alcohol, and, methylacetate. A number of suitable solvents are also specified.

322,471. TREATING GASES WITH ARC DISCHARGES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, August 29, 1928.

Gases or vapours are treated with a number of arc dis-

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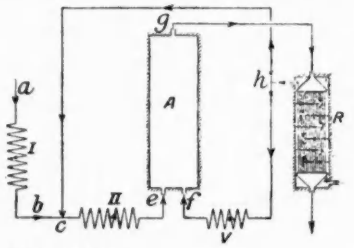
charges in parallel with a pressure difference of at least 100 mm. of mercury between different parts of each discharge gap. The gas may be supplied through hollow electrodes, Fig. 1, or through tubes surrounding the electrodes, or through tubes converging in the middle of discharge gap, Fig. 3.

322,489. DESTRUCTIVE HYDROGENATION. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, September 3, 1928.

A mixture of brown coal and a high-boiling coal hydrogenation product is forced through a heating coil I of Siemens-Martin steel, where it is heated to 320° C. About 30 per cent. of the hydrogenating gas passing through the heat exchanger R is drawn off at *h*, mixed with the coal sludge at *c*, and the

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mixture heated in a coil II of slightly alloyed steel to 430° C. The mixture passes into the reaction chamber A, and the remainder of the hydrogenating gas is heated to 430° C. in a heat exchanger V, and enters the chamber A through a porous plate at *f*. The reaction products pass through the heat exchanger R in counter-current to the hydrogenating gas.

322,496. PLASTIC COMPOSITIONS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, September 6, 1928.

These compositions, which may be used in the manufacture of linoleum or as an addition to rubber products, lacquers, etc., are obtained by heating to above 150° C., the liquid acid portion insoluble in petroleum ether of an oxidation product of paraffin hydrocarbons or waxes, with half or more of the stoichiometrical quantity of organic compounds containing at least two hydroxyl groups in the molecule, *e.g.*, glycerol. Organic unsaturated or hydroxy carboxylic acids or their glycerides may also be added, the liquid acid portion being treated before or during the heating with siccatives.

322,524. OLEFINES. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, September 7, 1928.

To obtain olefines, the corresponding alkyl sulphuric acid compounds are heated in the presence of salts of di- or polybasic acids or mono-basic acids. In an example, a mixture of sulphuric acid, ethyl sulphuric acid, and diethyl sulphuric acid is added to phosphorite heated to 250°–500° C. to obtain ethylene and calcium superphosphate. In other examples, ethyl sulphuric acid is dropped on sodium sulphate at 300° C., propyl sulphuric acid is heated with mono- or di-sodium phosphate to 250° C., and ethyl sulphuric acid is added to sodium chloride at 300° C.

322,537–8–9, 322,540–1–2–3. PAINTS AND COATING COMPOSITIONS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, June 2, 1928.

322,537. Nitrocellulose is mixed with soluble resinous condensation products of aromatic di-basic acids with polyhydric alcohols containing 4–6 hydroxyl groups per molecule. The resins are obtained from phthalic or halogenated phthalic acids and sorbitol or penta-erythritol, or their hydroxy-alkyl ethers. The compositions may also include colouring materials, fillers, solvents, cellulose esters of aliphatic carboxylic acids, softeners, and natural or artificial resins. Examples of these additions and of the compositions themselves are given.

322,538. Nitrocellulose is mixed with resinous condensation products of aromatic di-basic acids with glycols or their hydroxy-alkyl ethers where one or both hydroxyl groups are etherified with a glycol. The resins are obtained from phthalic or halogenated phthalic acids and ethylene, propylene, butylene, or other glycols. Other substances may be added as in Specification No. 322,537 above.

322,539. Nitrocellulose is mixed with resinous condensation products of aromatic di-basic acids with hydroxy-alkyl ethers of glycerols with glycols or glycerols. The resins are obtained from phthalic or halogenated phthalic acids and hydroxy-alkyl ethers of glycerol or its homologues such as penta-glycerol. The compositions may contain other additions as in Specification No. 322,537 above.

322,540. Lower fatty acids of cellulose such as cellulose tri-acetate or butyrate, acetone soluble cellulose acetate, etc., are mixed with resinous condensation products of aliphatic di-basic acids with poly-hydric alcohols or their hydroxy-alkyl ethers with the same or another aliphatic polyhydric alcohol. The resins are obtained from succinic, maleic, adipic, oxalic, or di-glycollic acids, and glycols, sorbitol, or penta-erythritol. The compositions may contain other additions such as those described in Specification No. 322,537 above.

322,541. The esters of cellulose mentioned in Specification No. 322,540 above are mixed with resinous condensation products of aromatic di-basic acids with polyhydric alcohols containing 4–6 hydroxy groups per molecule, or their hydroxy-alkyl ethers with the same or another polyhydric alcohol. The resins are obtained from phthalic or halogenated phthalic acids, and sorbitol, penta-erythritol, etc. The compositions may contain other additions such as those described in Specification No. 322,537 above.

322,542. The esters of cellulose mentioned in Specification No. 322,540 above are mixed with resinous condensation products of aromatic di-basic acids with glycols or their hydroxy-alkyl ethers with a glycol. The resins are obtained from phthalic or halogenated phthalic acids and ethylene, butylene, or propylene glycol. The compositions may contain other additions such as those described in Specification No. 322,537 above.

322,543. The cellulose esters mentioned in Specification No. 322,540 above are mixed with resinous condensation products of aromatic di-basic acids with hydroxy-alykl esters of tri-hydric alcohols. The resins are obtained from phthalic or halogenated phthalic acids and the hydroxy-alkyl ethers of glycerol or its homologues such as penta-glycerol. The compositions may contain other additions such as those described in Specification No. 322,537 above.

322,576. DYES AND INTERMEDIATES. Imperial Chemical Industries, Ltd., Millbank, London. F. Lodge, and W. W. Tatum, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, October 2, 1928.

An anthraquinone-2-sulphonic acid containing in the 1:4-positions amino or substituted amino groups is treated with a warm aqueous alkaline solution of glucose, fructose, or other polyhydroxylated substance having a similar reducing action, to split off a 2-sulphonic acid group. Examples are given of the treatment of the 2-sulphonic derivatives of 1-amino-4-methyl-amino-anthraquinone, 1-amino-4-anilino-anthraquinone, 1-amino-4-*p*-toluidino-anthraquinone, 1-amino-4-*p*-amino-anilino-anthraquinone, and 1:4-diamino-anthraquinone to remove the sulphonic acid group. This treatment applied to 1-amino-4-anilino-anthraquinone-2:8-disulphonic acid (the preparation of which is described) yields 1-amino-4-anilino-anthraquinone-8-sulphonic acid. These products are dyes for acetate silk.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention :—297,441 (J. R. Geigy Akt.-Ges.), relating to acid dyestuffs of the pheno-naphthosafranine series, see Vol. XIX, p. 497; 298,234 (I.G. Farbenindustrie Akt.-Ges.), relating to derivatives of aminoaryl antimony compounds, see Vol. XIX, p. 543; 308,731 (Schering Kahlbaum Akt.-Ges.), relating to anhydrous formic acid, see Vol. XX, p. 546; 308,771 (Ternstedt Manufacturing Co.), relating to chromium plating, see Vol. XX, p. 47 (Metallurgical Section).

### Specifications Accepted with Date of Application

293,808. Benzine, fuel oil, lubricating oil, and the like from solid fuels, Method of obtaining. A. Pott and H. Broche. July 12, 1927.

295,938. Decomposition of hydrocarbons by explosion. A. Fechter and P. Burger. August 20, 1927.

299,064. Sulphuric acid and/or halogen derivatives of formaldehyde, Production of. K. Fuchs and E. Katscher. October 21, 1927.

300,264. Sulphonic acids, naphthenic acids, and the like, Purification of. Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. November 11, 1927.

303,494–5. Concentrated acetic acid, Production of. H. Suida. January 5, 1928.

304,688. Sulphuric acid, Production of. Mansfeld Akt.-Ges. für Bergbau und Huttenbetrieb, H. Krebs, and R. Borchers. January 24, 1928.

311,271. High-percentage manganese dioxide, Production of. I.G. Farbenindustrie Akt.-Ges. May 8, 1928.

314,860. Hydrogen sulphide and hydrogen cyanide from gases, Process and apparatus for separating. Soc-Anon. Hollando-Belge pour la Fabrication du Coke. July 3, 1928.

316,547. Unsaturated esters, Preparation of. Rohm and Haas Akt.-Ges. July 30, 1928.

324,002. Dyestuffs. R. Tonkin, J. S. Wilson, J. Thomas, and Scottish Dyes, Ltd. July 9, 1928.

324,004. Polymerisation products of diolefines, Production of. J. Y. Johnson and A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) August 14, 1928.

324,009. Metal alloy. H. J. Henbrey and C. J. M. Thornhill. October 11, 1928.

324,016. Boron trifluoride, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) October 12, 1928.

324,017. Dyestuffs and dyestuff intermediates of the di-naphthylene dioxide series. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) October 12, 1928.

324,018. Sulphonated isatoic acid anhydrides and the corresponding *o*-amino-carboxylic acids, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) October 13, 1928.

324,041. Diazo-amino compounds, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) October 15, 1928.

324,079. Nitrogenous vat dyestuffs, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) October 15, 1928. Addition to 318,180.

324,083. Paraffin wax, Purification of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) August 15, 1928.

324,084. Anthraquinone vat dyestuffs, Production of. British Alizarine Co., Ltd., and P. P. Beghin. August 18, 1928.

324,090. Sulphonic acids of the nitro-halogen diaryl-ketones and sulphones. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) October 15, 1928.

324,112. Heavier hydrocarbons, Processes for treating. C. A. Jensen. (*Jenkins Petroleum Process Co.*) October 18, 1928.

324,119. Water soluble compounds of indigoid dyestuffs, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) October 19, 1928.

324,120. Colour lakes and pigment dyestuffs, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) October 19, 1928.

324,122. Hydrogen and phosphoric acid, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) October 20, 1928.

324,158. Exothermic gas reactions, Apparatus for carrying out. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) November 19, 1928.

324,189. Products of a high state of oxidation from hydrocarbons, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) December 14, 1928.

324,190. Nitric acid from nitrosyl chloride, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) December 14, 1928.

324,199. Sulphuric acid and artificial Portland cement, Manufacture of. H. Meuris. October 6, 1928.

324,220. Oxides of nitrogen, Recovery of. J. Y. Johnson. (*L. Bergfeld.*) January 16, 1929.

324,287. Rubber, Manufacture of. Dewey and Almy Chemical Co. and D. M. Stevens. March 19, 1929.

## Applications for Patents

*[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]*

Boot's Pure Drug Co., Ltd., Child, R., and Pyman, F. L. Preparation of derivatives of 3:4-dihydroisoquinoline. 3,383. January 31.

Caro, N., and Frank, A. R. Fixation of ammonia-nitrogen. 3,127. January 29. (Germany, January 30, 1929.)

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of azo dyestuffs. 2,816. January 27.

—— Plant-protecting media. 3,091. January 29.

—— Manufacture of hormone preparation. 3,092. January 29.

Della Lucia, O. Process for extracting iodine from solutions containing iodine salts. 2,953. January 28.

Dreaper, W. P. Manufacture of cellulose esters solutions, etc. 3,298. January 31.

Du Pont de Nemours and Co., E. I. Manufacture of organic esters and acids. 3,400. January 31.

Elkington, H. D. and Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. Manufacture of products from carbonaceous materials. 3,266. January 30.

Gee, H. T. P., and Annable and Ferro Alloy Co. of Africa, Proprietary, Ltd. Separating gold and antimony from sulphide of antimony ores. 2,743. January 27.

Gray, G. W., and Levy, S. I. Production of iron compounds and chlorine. 3,398. January 31.

Hooley, L. J., Thomas, J., and Scottish Dyes, Ltd. Production of dyestuff derivatives. 3,233. January 30.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Recovery of liquids from liquids converted into solid-like form. 3,057. January 29.

—— Hydrogenation of coal tars, etc. 3,359 January 31.

—— Manufacture of alkylene cyanhydrins. 3,360. January 31.

—— Manufacture of chromiferous dyestuffs. 3,361. January 31.

—— Production of dispersions. 3,362. January 31.

—— Oxidation of organic substances. 3,363. January 31.

—— Manufacture of iron having special magnetic properties. 3,238. January 30.

I.G. Farbenindustrie Akt.-Ges. Manufacture of artificial silk. 2,778. January 27. (Germany, January 25, 1929.)

—— Manufacture of azo dyestuffs containing chromium. 2,823. January 27.

—— Manufacture of N-substituted benzimidazolone-arsinic acids. 2,950. January 28. (Germany, February 11, 1929.)

—— Photographic reproduction. 3,058. January 29. (Germany, January 29, 1929.)

—— Manufacture of mixed ethers of cellulose. 3,213. January 30. (Germany, February 25, 1929.)

—— Manufacture of 1:3-butylene-glyco. 3,214. January 30. (Germany, 30, 1929.)

—— Manufacture of vat dyestuffs containing sulphur. 3,215. January 30. (Germany, January 31, 1929.)

Imperial Chemical Industries, Ltd. Carrying out gas reactions. 2,729, 2,730. January 27.

—— Production of hydrogen cyanide. 2,780. January 27. (March 2, 1929.)

—— Treatment of coke oven gas, etc. 2,781. January 27. (April 20, 1929.)

—— Production of hydrocyanic acid. 2,782. January 27. (December 24, 1929.)

—— Cooling coke and obtaining a nitrogen mixture. 2,842. January 28.

—— Production of fertilisers. 3,076. January 29.

—— Ammonia oxidation. 3,210. January 30.

—— Hydration of acetylene. 3,308. January 31.

—— Manufacture of organic esters and acids. 3,400. January 31.

—— Production of ammonium sulphate. 3,401. January 31.

Mond. A. L., and Soc. Chimique de la Grande Paroisse Azote et Produits Chimiques. Combustion of carbonaceous substances. 2,909. January 28.

Rodd, E. H., Thomson, R. F., Thomas, J., Shaw, C., and Scottish Dyes, Ltd. Production of dyestuffs, etc. 2,986. January 28.

Scottish Dyes, Ltd., Thomas, J., Thomson, R. F., and Thornley, S. Treatment of vat dyestuffs, etc. 3,234. January 30.

Soc. of Chemical Industry in Basle. Manufacture of vat dyestuffs. 2,777. January 27. (Switzerland, January 25, 1929.)

—— Manufacture of indigoid dyestuffs. 2,949. January 28. (Switzerland. February 2, 1929.)

—— Manufacture of disazo dyestuffs. 3,216. January 30. (Switzerland, February 2, 1929.)

Turski, J. F. Production of colouring matters. 2,946. January 28.

Tyrer, D. Cooling coke and obtaining a nitrogen hydrogen mixture. 2,842. January 28.

—— Production of ammonium sulphate. 3,401. January 31.

## Chemists' Smoking Concert

A SMOKING concert of the London section of the British Association of Chemists was held at the Broad Street Station Restaurant on Friday, January 31. Mr. W. H. Woodcock (chairman) presided over a large attendance, which fully justified the decision to include two concerts in the winter programme, and a very enjoyable evening was spent. The annual dinner of the section will be held at the Hotel Belgravia on Saturday, March 1, when a number of distinguished guests will be present.

# Weekly Prices of British Chemical Products

*The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.*

## General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.
ACID, CHROMIC.—1s. 0⅝d. per lb.
ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. per carboy d/d, according to purity, strength and locality.
ACID NITRIC, 80° Tw.—Spot £20 to £25 per ton, makers' works according to district and quality.
ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
AMMONIA (ANHYDROUS).—Spot, 10d. per lb., d/d in cylinders.
AMMONIUM BICHROMATE.—8¼d. per lb.
BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.
BLEACHING POWDER, 35%.—Spot, £7 10s. per ton d/d station in casks, special terms for contracts.
BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags carriage paid any station in Great Britain.)
CALCIUM CHLORIDE (SOLID).—Spot, £4 15s. to £5 5s. per ton d/d in drums.
CHROMIUM OXIDE.—10d. and 10½d. per lb. according to quantity.
COPPER SULPHATE.—£25 to £25 10s. per ton.
METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 3d. to 1s. 8d. per gall. pyridinised industrial, 1s. 5d. to 1s. 10d. per gall.; mineralised 2s. 4d. to 2s. 8d. per gall.; 64 O.P., 1d. extra in all cases.
NICKEL SULPHATE.—£38 per ton d/d.
NICKEL AMMONIA SULPHATE.—£38 per ton d/d.
POTASH CAUSTIC.—£30 to £33 per ton.
POTASSIUM BICHROMATE CRYSTALS.—4⅜d. per lb. nett d/d U.K. spot; ground ½d. per lb. extra.
POTASSIUM CHLORATE.—3¾d. per lb., ex-wharf, London, in cwt. kegs.
POTASSIUM CHROMATE.—8¼d. per lb.
SALAMMONIAC.—Firsts lump, spot, £42 10s. per ton d/d station in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.
SALT CAKE, UNGROUND.—Spot, £3 7s. 6d. per ton d/d station in bulk.
SODA ASH, 58° E.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.
SODA CAUSTIC, SOLID, 76/77%.—Spot, £14 10s. per ton, d/d station in drums.
SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2 cwt. bags.
SODIUM ACETATE 97/98%.—£21 per ton.
SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.
SODIUM BICHROMATE CRYSTALS, CAKE AND POWDER.—3⅝d. per lb. nett d/d U.K. spot. Anhydrous ¾d. per lb. extra.
SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.
SODIUM CHLORATE.—2¾d. per lb.
SODIUM CHROMATE.—3½d. per lb.
SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.
SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.
SODIUM SILICATE, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.
SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d address in bags.
SODIUM SULPHIDE CONC. SOLID.—Spot, £10 5s. per ton d/d in drums. Crystals—Spot, £7 10s. per ton d/d in sellers' casks.
SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

## Coal Tar Products

ACID CARBOLIC CRYSTALS.—7d. to 8½d. per lb. Crude 60's, 2s. 4d. to 2s. 6d. per gall.
ACID CRESYLIC 99/100.—2s. 2d. to 2s. 7d. per gall. Pure, 5s. to 5s. 2d. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Pale, 95%, 1s. 9d. to 1s. 10d. per gall. 98%, 2s. 2d. to 2s. 3d. Dark, 1s. 6d. to 2s. Refined, 2s. 7d. to 2s. 10d. per gall.
ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.
ANTHRACENE OIL, STRAINED, 1080/1090.—4¾d. to 5¼d. per gall. 1100, 5½d. to 6d. per gall.; 1110, 6d. to 6½d. per gall. Unstrained (Prices only nominal).
BENZOLE.—Prices at works: Crude, 10d. to 11d. per gall.; Standard Motor, 1s. 5d. to 1s. 6d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall.; Pure, 1s. 10d. to 1s. 11d. per gall.
TOLUOLE.—90%, 1s. 9d. to 2s. 1d. per gall. Firm. Pure, 1s. 11d. to 2s. 5d. per gall.
XYLOL.—1s. 5d. to 1s. 10d. per gall. Pure, 1s. 8d. to 2s. 1d. per gall.
CREOSOTE.—Cresylic, 20/24%, 6¾d. to 7d. per gall.; Heavy, 6½d. to 6¾d. per gall. Middle oil, 4½d. to 5d. per gall. Standard specification, 3d. to 4d. per gall. Light gravity, 1¼d. to 1⅜d. per gall. ex works. Salty, 7½d. per gall.
NAPHTHA.—Crude, 8¼d. to 8⅜d. per gall. Solvent, 90/160, 1s. 3d. to 1s. 3½d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 6d. per gall. Solvent 90/190, 1s. to 1s. 3d. per gall.
NAPHTHALENE, CRUDE.—Drained Creosote Salts, £4 10s. to £5 per ton. Whizzed, £5 per ton. Hot pressed, £8 10s. per ton.
NAPHTHALENE.—Crystals, £12 5s. per ton. Purified Crystals, £14 10s. per ton. Flaked, £14 to £15 per ton, according to districts.
PITCH.—Medium soft, 46s. to 47s. 6d. per ton, f.o.b., according to district. Nominal.
PYRIDINE.—90/140, 3s. 9d. to 4s. per gall. 90/160, 3s. 6d. to 3s. 9d. per gall. 90/180, 1s. 9d. to 2s. 3d. per gall. Heavy prices only nominal.

## Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:
ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.
ACID ANTHRANILIC.—6s. per lb. 100%.
ACID BENZOIC.—1s. 8½d. per lb.
ACID GAMMA.—4s. 6d. per lb.
ACID H.—3s. per lb.
ACID NAPHTHIONIC.—1s. 6d. per lb.
ACID NEVILLE AND WINTHER.—4s. 9d. per lb.
ACID SULPHANILIC.—8½d. per lb.
ANILINE OIL.—8d. per lb. naked at works.
ANILINE SALTS.—8d. per lb. naked at works.
BENZALDEHYDE.—2s. 3d. per lb.
BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.
BENZOIC ACID.—1s. 8½d. per lb.
*o*-CRESOL 29/31° C.—£3 1s. 10d. per cwt., in 1 ton lots.
*m*-CRESOL 98/100%.—2s. 9d. per lb., in ton lots d/d.
*p*-CRESOL 32/34° C.—2s. per lb., in ton lots d/d.
DICHLORANILINE.—1s. 10d. per lb.
DIMETHYLANILINE.—1s. 11d. per lb.
DINITROBENZENE.—8d. per lb. naked at works. £75 per ton.
DINITROCHLORBENZENE.—£84 per ton d/d.
DINITROTOLUENE.—48/50° C. 7½d. per lb. naked at works. 66/68° C 9d. per lb. naked at works.
DIPHENYLAMINE.—2s. 10d. per lb. d/d.
*a*-NAPHTHOL.—2s. per lb. d/d.
*B*-NAPHTHOL.—10d. per lb. d/d.
*a*-NAPHTHYLAMINE.—1s. 3d. per lb.
*B*-NAPHTHYLAMINE.—3s. per lb.
*o*-NITRANILINE.—5s. 9d. per lb.
*m*-NITRANILINE.—3s. per lb. d/d.
*p*-NITRANILINE.—1s. 8d. per lb.
NITROBENZENE.—6d. per lb. naked at works.
NITRONAPHTHALENE.—1s. 3d. per lb.
R. SALT.—2s. 2d. per lb.
SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.
*o*-TOLUIDINE.—8d. per lb.
*p*-TOLUIDINE.—1s. 9d. per lb. naked at works.
*m*-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.
N. W. ACID.—4s. 9d. per lb. 100%.

## Wood Distillation Products

ACETATE OF LIME.—Brown, £9 15s. to £10 5s. per ton. Grey, £16 10s. to £17 10s. per ton. Liquor, 9d. per gall.
ACETONE.—£78 per ton.
CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.
IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.
WOOD CREOSOTE.—1s. 9d. per gall., unrefined.
WOOD NAPHTHA, MISCIBLE.—3s. 8d. to 3s. 11d. per gall. Solvent, 4s. to 4s. 3d. per gall.
WOOD TAR.—£3 10s. to £4 10s. per ton.
BROWN SUGAR OF LEAD.—£38 per ton.

## Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 3d. per lb. according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.
ARSENIC SULPHIDE, YELLOW.—1s. 10d. to 2s. per lb.
BARYTES.—£5 10s. to £7 per ton, according to quality.
CADMIUM SULPHIDE.—5s. to 6s. per lb.
CARBON BISULPHIDE.—£25 to £27 10s. per ton, according to quantity.
CARBON BLACK.—4½d. per lb., ex wharf.
CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity, drums extra.
CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.
DIPHENYLGUANIDINE.—3s. 9d. per lb.
LITHOPONE, 30%.—£20 to £22 per ton.
SULPHUR.—£10 to £13 per ton, according to quality.
SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.
SULPHUR PRECIP. B.P.—£55 to £60 per ton.
ZINC SULPHIDE.—8d. to 11d. per lb.

## Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£37 per ton, ex wharf London, barrels free.

ACID, ACETYL SALICYLIC.—2s. 9d. to 2s. 10½d. per lb., according to quantity.

ACID, BENZOIC B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.

ACID, BORIC B.P.—Crystal, £32 per ton; powder, £36 per ton; extra fine powder, £38 per ton. Packed in 2-cwt. bags carriage paid any station in Great Britain.

ACID, CAMPHORIC.—19s. to 21s. per lb.

ACID, CITRIC.—1s. 10¾d. to 1s. 11d. per lb., less 5%.

ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.

ACID, MOLYBDIC.—5s. 3d. per lb. in ¼ cwt. lots. Packages extra. Special prices for quantities and contracts.

ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.

ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 6d. per lb. Technical.—1s. to 1s. 2d. per lb.

ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.

ACID, TARTARIC.—1s. 3½d. per lb., less 5%.

ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.

AMIDOL.—7s. 6d. to 9s. per lb., d/d.

AMIDOPYRIN.—7s. 9d. to 8s. per lb.

AMMONIUM BENZOATE.—3s. 3d. to 3s. 9d. per lb., according to quantity. 18s. per lb. ex Gum.

AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.

AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ¼ cwt. lots. Packages extra. Special prices for quantities and contracts.

ATROPHINE SULPHATE.—9s. per oz.

BARBITONE.—5s. 9d. to 6s. per lb.

BENZONAPHTHOL.—3s. to 3s. 3d. per lb .spot.

BISMUTH CARBONATE.—8s. 9d. per lb.

BISMUTH CITRATE.—8s. 3d. per lb.

BISMUTH SALICYLATE.—8s 3d. per lb.

BISMUTH SUBNITRATE.—7s. 6d. per lb.

BISMUTH NITRATE.—Cryst. 5s. 3d. per lb.

BISMUTH OXIDE.—11s. 3d. per lb.

BISMUTH SUBCHLORIDE.—10s. 3d. per lb.

BISMUTH SUBGALLATE.—7s. 3d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.

BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0¼d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts. 11d. per lb.

BORAX B.P.—Crystal, £21 per ton; powder, £22 per ton; powder, ex. fine, £23 per ton. Packed in 1-or 2-cwt. bags carriage paid any station in Great Britain.

BROMIDES.—Ammonium, 2s. 0d. per lb.; potassium, 1s. 8d. per lb.; granular, 1s. 7½d. per lb.; sodium, 1s. 11d. per lb. Prices for 1 cwt. lots.

CALCIUM LACTATE.—B.P., 1s. 1¾d. to 1s. 3d. per lb., in 1-cwt. lots.

CAMPHOR.—Refined flowers, 3s. 3d. to 3s. 4d. per lb., according to quantity; also special contract prices.

CHLORAL HYDRATE.—3s. 1d. to 3s. 4d. per lb.

CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.

CREOSOTE CARBONATE.—6s. per lb.

ETHERS.—S.G. ·730—11d. to 1s. per lb., according to quantity; other gravities at proportionate prices.

FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.

GUAIACOL CARBONATE.—4s. 6d. to 4s. 9d. per lb.

HEXAMINE.—2s. 3d. to 2s. 6d. per lb.

HOMATROPINE HYDROBROMIDE.—30s. per oz.

HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.

HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.

HYDROQUINONE —3s. 9d. to 4s. per lb., in cwt. lots.

HYPOPHOSPHITES.—Calcium, 2s. 5d. per lb.; potassium, 2s. 8½d. per lb.; sodium, 2s. 7½d. per lb., in 1 cwt. lots, assorted.

IRON AMMONIUM CITRATE.—B.P., 2s. 8d. to 2s. 9d. per lb. Green, 2s. 10d. to 3s. per lb. U.S.P., 2s. 7d. to 2s. 10d. per lb.

IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.

IRON QUININE CITRATE.—B.P., 8¾d. to 9¼d. per oz., according to quantity.

MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.

MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.

MENTHOL.—A.B.R. recrystallised B.P., 17s. 6d. per lb. net; Synthetic, 9s. 6d. to 11s. 9d. per lb.; Synthetic detached crystals, 10s. to 11s. 9d. per lb., according to quantity; Liquid (95%), 9s. per lb.

MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.

METHYL SALICYLATE.—1s. 6d. to 1s. 8d. per lb.

METHYL SULPHONAL.—18s. 6d. to 20s. per lb.

METOL.—9s. to 11s. 6d. per lb. British make.

PARAFORMALDEHYDE.—1s 9d. per lb. for 100% powder.

PARALDEHYDE.—1s. 4d. per lb.

PHENACETIN.—3s. 2½d. to 3s. 9d. per lb.

PHENAZONE.—5s. 11d. to 6s. 1½d. per lb.

PHENOLPHTHALEIN.—5s. 11d. to 6s. 1½d. per lb.

POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—103s. per cwt., less 2½ per cent.

POTASSIUM CITRATE.—B.P.C., 2s. 6d. per lb. in 28 lb. lots. Smaller quantities 1d. per lb. more.

POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.

POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.

POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included f.o.r. London.

POTASSIUM PERMANGANATE.—B.P. crystals, 5½d per lb., spot.

QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins

RESORCIN.—2s. 10d. to 3s. per lb., spot.

SACCHARIN.—43s. 6d. per lb.

SALOL.—2s. 3d. to 2s. 6d. per lb.

SODIUM BENZOATE B.P.—1s. 8d. to 1s. 11d. per lb.

SODIUM CITRATE, B.P.C., 1911, AND U.S.P. VIII.—2s. 2d. per lb., B.P.C. 1923, and U.S.P. IX—2s. 6d. per lb. Prices for 28 lb. lots. Smaller quantities 1d. per lb. more.

SODIUM FERROCYANIDE.—4d. per lb., carriage paid.

SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.

SODIUM NITROPRUSSIDE.—16s. per lb.

SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—100s. per cwt. Crystals, 5s. per cwt. extra.

SODIUM SALICYLATE.—Powder, 2s. 2d. to 2s. 3d. per lb. Crystal, 2s. 3d. to 2s. 4d. per lb.

SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 1d. per lb.

SODIUM SULPHIDE, ANHYDROUS.—£27 10s. to £29 10s. per ton, according to quantity. Delivered U.K.

SULPHONAL.—9s. 6d. to 10s. per lb.

TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.

THYMOL.—Puriss, 7s. 9d. to 8s. 6d. per lb., according to quantity. Firmer. Natural, 12s. per lb.

## Perfumery Chemicals

ACETOPHENONE.—7s. per lb.

AUBEPINE (EX ANETHOL).—12s. per lb.

AMYL ACETATE.—2s. 6d. per lb.

AMYL BUTYRATE.—5s. per lb.

AMYL CINNAMIC ALDEHYDE.—12s. per lb.

AMYL SALICYLATE.—3s. per lb.

ANETHOL (M.P. 21/22° C.).—6s. 6d. per lb.

BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.

BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. per lb.

BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.

BENZYL BENZOATE.—2s. 3d. per lb.

CINNAMIC ALDEHYDE NATURAL.—13s. 3d. per lb.

COUMARIN.—8s. 3d. per lb.

CITRONELLOL.—10s. 6d. per lb.

CITRAL.—8s. per lb.

ETHYL CINNAMATE.—6s. 6d. per lb.

ETHYL PHTHALATE.—2s. 9d. per lb.

EUGENOL.—10s. per lb.

GERANIOL (PALMAROSA).—19s. per lb.

GERANIOL.—7s. 6d. to 10s. per lb.

HELIOTROPINE.—7s. per lb.

ISO EUGENOL.—12s. per lb.

LINALOL.—Ex Bois de Rose, 12s. per lb. Ex Shui Oil, 10s. per lb.

PHENYL ETHYL ACETATE.—11s. per lb.

PHENYL ETHYL ALCOHOL.—9s. 6d. per lb.

RHODINOL.—48s. per lb.

SAFROL.—2s. per lb.

TERPINEOL.—1s. 6d. per lb.

VANILLIN, EX CLOVE OIL.—13s. to 15s. per lb. Ex Guaiacol, 13s. to 14s. per lb.

## Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. per lb.

ANISE OIL.—4s. 3d. per lb.

BERGAMOT OIL.—13s. per lb.

BOURBON GERANIUM OIL.—17s. 6d. per lb.

CAMPHOR OIL, WHITE.—16os. per lb.

CASSIA OIL, 80/85%.—4s. 9d. per lb.

CINNAMON OIL LEAF.—7s. 9d. per oz.

CITRONELLA OIL.—Java, 2s. 11d. per lb., c.i.f. U.K. port; pure, Ceylon, 2s. 8d. per lb.

CLOVE OIL (90/92%).—7s. 6d. per lb.

EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%.—1s. 9d. per lb.

LAVENDER OIL.—Mont Blanc, 38/40%, 12s. 3d., per lb.

LEMON OIL.—8s. per lb.

LEMONGRASS OIL.—4s. per lb.

ORANGE, SWEET.—12s. per lb.

# London Chemical Market

*The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

*London, February 6, 1930.*

THE chemical market has shown scarcely any change during the past week, prices continuing in the main firm. Business has been of fair proportion, and there is a better tendency as regards forward business. Export trade also shows a slight improvement.

## General Chemicals

ACETONE.—Fair and steady demand, with price unchanged at £71 10s. to £80 per ton, according to quantity.

ACETIC ACID.—Good demand for spot and forward delivery, with prices steady at £36 10s. for 80% technical and £37 10s. for 80% edible.

ACID BORIC.—Quoted at higher rate, and steady demand.

ACID CITRIC.—As is usual at this time of the year demand is only for small quantities, but there has been no further change in the price, which now is quoted steady at about 2s. 1d. per lb., less 5%.

ACID LACTIC.—Rather more business passing in pale grades, with the price for 50% by weight steady at £43 per ton.

ACID OXALIC.—Continues in active request with the market firm at £30 7s. 6d. to £32 per ton, according to quantity.

ACID TARTARIC.—Demand rather better recently, and price slightly firmer at about 1s. 3½d. to 1s. 3¾d. per lb., less 5%.

ALUMINA SULPHATE.—Unchanged in price at £8 to £8 5s. per ton for 17/18% iron free quality, and there is a substantial demand.

ARSENIC.—Still only in slight request with the market showing no change at £16 5s. to £16 10s. per ton f.o.r. mines.

BORAX.—Maintained at the higher levels with satisfactory demand.

CREAM OF TARTAR.—Improved demand, and the price is continuing steady at about £104 per ton.

COPPER SULPHATE.—Conditions are firmer, with the demand increasing. Prices are firm at £28 per ton, less 5%.

FORMALDEHYDE.—In quite good request and prices now steady at about £36 per ton.

LEAD ACETATE.—Demand has not been quite so active recently, but there has been no change in the price. White is quoted at about £44 per ton and brown at £43.

LEAD NITRATE.—Steady trade passing at about £33 per ton.

LIME ACETATE.—Steady demand with prices unchanged.

LITHOPONE.—Regular demand with prices steady at £19 15s. to £23 per ton, according to quantity.

POTASSIUM CARBONATE.—Quoted at £27 per ton for 96/98% arsenic, free quality and in fair demand.

POTASSIUM PERMANGANATE.—B.P. needle crystals quoted at 5½d. per lb., with market showing firm tendency.

SODIUM ACETATE.—Demand is a little brisker, with price unchanged at about £21 10s. to £22 per ton.

SODIUM BICHROMATE.—Active at 3⅜d. per lb.

SODIUM HYPOSULPHITE.—Unchanged at £8 10s. to £9, for the commercial crystals, demand for which is fairly brisk and the photographic crystals improving in demand at £14 to £15 per ton.

SODIUM NITRITE.—Unchanged at £20 per ton.

SODIUM PRUSSIATE.—Firm and in good request at 4¾d. to 5¼d. per lb., according to quantity.

SODIUM SULPHIDE.—Regular and steady business at the higher rates.

TARTAR EMETIC.—Little more business on the market at 11d. per lb., at which the product is quoted firm.

ZINC SULPHATE.—Unchanged at about £13 10s. per ton, with a fair demand.

## Coal Tar Products

Prices for coal tar products remain steady, and the market shows a better tone, inquiry being more widespread.

MOTOR BENZOL.—Unchanged at about 1s. 5½d. to 1s. 6d. per gallon f.o.r.

SOLVENT NAPHTHA.—Quoted at about 1s. 2½d. to 1s. 3d. per gallon f.o.r.

HEAVY NAPHTHA.—Remains at about 1s. 1d. per gallon f.o.r.

CREOSOTE OIL.—Unchanged at 3d. to 3½d. per gallon f.o.r. in the north, and at 4d. to 4½d. per gallon in London.

CRESYLIC ACID.—Firm, 98/100% quality being quoted at 2s. per gallon, and dark quality 95/97% at 1s. 10d. per gallon, ex works.

NAPHTHALENES.—Fire-lighter quality is quoted at £3 10s. to £3 15s. per ton, 74/76 quality at £4 to £4 5s. per ton, and 76/78 quality at about £5 per ton.

PITCH.—Little demand for shipment up to the end of the year, and pitch can be obtained at 45s. to 47s. 6d. per ton f.o.b. East Coast ports.

## Nitrogen Fertilisers

*Sulphate of Ammonia.*—The export price for sulphate of ammonia remains steady at about £8 5s. per ton f.o.b. U.K. port, in single bags for neutral quality, basis 20·60% nitrogen. As the consuming season advances, buyers tend to increase their purchases. The home trade remains quiet. On account of the bad weather and water-logged condition of a large part of the country, a brisk demand cannot be expected at the moment.

*Nitrate of Soda.*—There is no change to report.

## Latest Oil Prices

LONDON, February 5.—LINSEED OIL was firm but quiet at 7s. 6d. to 5s. per ton advance. Spot, ex mill, £44 5s.; February, £40 2s. 6d.; March-April, £39 2s. 6d.; and May-August, £38 15s., naked. RAPE OIL was dull; crude, extracted, £38 10s.; and technical refined, £40, naked, ex wharf. COTTON OIL was quiet and 10s. per ton lower; Egyptian, crude, £28; refined common edible, £33 10s.; deodorised, £35 10s., naked, ex mill. TURPENTINE was inactive; American, spot, 42s. 9d.; and March-April, 43s. 3d. per cwt.

HULL.—LINSEED OIL.—Spot, £42 15s.; February, £41 7s. 6d.; March-April, £39 10s.; May-August, £39 5s. per ton, naked. COTTON OIL.—Egyptian crude, spot, £26 15s.; edible refined, spot, £30 10s.; technical, spot, £30 5s.; deodorised, spot, £32 10s. per ton, naked. PALM KERNEL OIL.—Crude, 5½ per cent., spot, £31 per ton naked. GROUNDNUT OIL.—Crushed/extracted, spot, £33 10s.; deodorised, spot, £37 10s. per ton. SOYA OIL.—Extracted and crushed, spot, £30; deodorised, spot, £33 10s. per ton. RAPE OIL.—Crushed/extracted, spot, £37 10s.; refined, spot, £39 10s. per ton. CASTOR OIL.—First, spot, 43s. per cwt., in barrels; others unaltered. TURPENTINE and COD OIL unchanged.

## South Wales By-Products

NEW year expectations for South Wales by-product activities have not yet been realised and business continues to be slow. Pitch is experiencing an unusually quiet time, little buying being done at quotations ranging from 47s. to 49s. per ton, delivered. Road tar has a moderate demand at from 11s. to 14s. per 40-gallon barrel, but refined tars, both gasworks and coke-oven tars, are quieter. Values, however, are unchanged. Solvent naphtha is quiet round about 1s. 3d. to 1s. 5d. per gallon, while heavy naphtha has practically no demand. Motor benzol is in better request at from 1s. 4d. to 1s. 6d. per gallon, while creosote has improved slightly at from 3½d. to 4½d. per gallon. Patent fuel and coke exports are moderately good. Patent fuel prices are unchanged at 22s. t 22s. 6d., ex-ship Cardiff, and from 1s. to 1s. 6d. less ex ship Swanseo and Newport. Coke, furnace and foundry grades, are unchanged at Cardiff, Swansea and Newport.

## Scottish Coal Tar Products

PRICES of all items are substantially as last quoted, with the exception of water-white products, which have improved. Motor benzole is being bought up in large quantities, while naphthas are commanding more attention.

*Cresylic Acid.*—The continued scarcity in Scotland is causing an upward tendency in prices, but values are held in check by the English production. Current prices may be taken as follows: Pale 99/100%, 1s. 10¾d. to 2s. 0¼d.; pale 97/99%, 1s. 9¼d. to 1s. 10d.; dark 97/99%, 1s. 7¾d. to 1s. 8¼d.; high boiling, 1s. 9¼d. to 1s. 11¼d.; all per gallon in buyers' packages at works.

*Carbolic Sixties.*—Nominal price is unchanged at 2s. 3d. to 2s. 5d. per gallon.

*Creosote Oil* remains very quiet indeed and there is no immediate sign of a revival. Prices are unaltered as follows: Specification oil, 4d. to 4¼d. per gallon; gas works ordinary, 2⅞d. to 3⅛d. per gallon; washed oil, 3d. to 3½d. per gallon; all f.o.r. works.

*Coal Tar Pitch* is unaltered. Stocks are low and export value is nominal at about 47s. 6d. to 50s. per ton, f.a.s. Glasgow. Small lots for home use command about 52s. 6d. to 55s. per ton, ex works.

*Blast Furnace Pitch* has become less active, and export orders are required. The fixed prices remain at 30s. per ton, f.o.r. works for home trade, and 35s. per ton, f.a.s. Glasgow, for export.

*Refined Coal Tar* continues in good demand for prompt and forward at 3⅞d. to 4⅛d. per gallon, ex works.

*Blast Furnace Tar.*—Orders are few and far between. The controlled price is still 2¾d. per gallon, rails works.

*Crude Naphtha* remains quiet at 4¾d. to 5¾d. per gallon, according to quality.

*Water White Products* have improved considerably during the week. Motor benzole has increased to 1s. 6d. to 1s. 6½d. per gallon, while 90/160 and 90/190 naphthas are firmer at about 1s. 1¾d to 1s. 2¾d. per gallon respectively, all free on rails works in buyers' packages.

# Scottish Chemical Market

*The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

*Glasgow, February 4, 1930.*

DURING the past week, business in the Scottish heavy chemical market has been fairly satisfactory and the proportion of inquiry in relation to orders received good. Export inquiry has also been fairly satisfactory, and prices for both home and export show little or no change from those last recorded.

### Industrial Chemicals

ACETONE, B.G.S.—£71 10s. to £80 per ton, ex wharf, according to quantity. Inquiry remains satisfactory.

ACID ACETIC.—This material is still scarce for immediate supply but prices remain unchanged as follows: 98/100% glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80% pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton. Powder, £32 per ton, packed in bags, carriage paid U.K. stations. There are a few fairly cheap offers made from the Continent.

ACID CARBOLIC, ICE CRYSTALS.—Quoted 8d. per lb. delivered.

ACID CITRIC, B.P. CRYSTALS.—Quoted 2s. per lb., less 5%, ex store, prompt delivery. Rather cheaper offers for early delivery from the Continent.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality 4s. per carboy. Dearsenicated quality, 5s. 6d. per carboy, ex works, full wagon loads

ACID NITRIC, 80° QUALITY.—£24 10s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—On offer at same price, viz.: 3¼d. per lb,. store. Offered from the Continent at 3⅛d. per lb., ex wharf.

ACID SULPHURIC.—£2 15s. per ton, ex works, for 144° quality; £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC, B.P. CRYSTALS.—Quoted 1s. 4d. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 1s. 4½d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted at round about £7 10s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 7s. 6d. per ton, c.i.f. U.K. ports. Crystal meal about 2s. 6d. per ton less.

AMMONIA, ANHYDROUS.—Quoted 7½d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Rather easier and Spot material now obtainable at round about £34 per ton, ex wharf. On offer for prompt shipment from China at £30 per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Quoted £18 per ton, ex wharf, prompt despatch from mines. Spot material still on offer at £19 15s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £11 per ton, c.i.f. U.K. ports. For Continental material price would be £10 per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 12s. 6d. per ton, delivered in minimum 4 ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. per ton to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Now quoted £35 per ton, ex store. Continental material on offer at about £34 per ton, ex wharf.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 5s. per ton, ex wharf.

LEAD, RED.—Price now £37 10s. per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £37 10s. per ton, c.i.f. U.K. ports.

LEAD ACETATE.—White crystals quoted round about £39 to £40 per ton, ex wharf. Brown on offer at about £2 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 O.P. quoted 1s. 4d. per gallon, less 2½%, delivered.

POTASSIUM BICHROMATE.—Quoted 4⅛d. per lb. delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer at £26 10s. per ton, ex store. Offered from the Continent at £25 5s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99¾/100%.—Powder quoted £25 10s. per ton, ex wharf. Crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 5½d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb., ex store. Offered for prompt delivery from the Continent at about 6¾d. per lb., ex wharf.

SODA, CAUSTIC.—Powdered, 98/99%, £17 10s. per ton in drums, £18 15s. per ton in casks. Solid, 76/77%, £14 10s. per ton in drums, and £14 12s. 6d. per ton for 70/72% in drums, all carriage paid buyers' stations, minimum 4-ton lots, for contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3⅝d. per lb., delivered buyers' premises with concession for contracts.

SODIUM CARBONATE. (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality 27s. 6d. per ton extra. Light soda ash £7 13s. per ton, ex quay, minimum 4-ton lots with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots. Prices for this year unchanged.

SODIUM NITRATE.—Chilean producers are now offering at £9 9s. per ton, carriage paid buyers' sidings, minimum 5-ton lots, but demand in the meantime is small.

SODIUM PRUSSIATE.—Quoted 5½d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Prices 55s. per ton, ex works, 57s. 6d. per ton delivered for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption. Solid, 60/62%, £9 15s. per ton. Broken, 60/62%, £10 15s. per ton. Crystals, 30/32%, £7 17s. 6d. per ton, all delivered buyers' works on contract, minimum 4-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £10 7s. 6d. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE, 98%.—British material offered at round about £20 per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £10 per ton, ex wharf.

NOTE.—Please note that the above prices are for bulk business and are not to be taken as applicable to small parcels.

## Chemical Trade Outlook

### Manchester Chamber of Commerce Report

THE annual report of chemical and allied trades section of the Manchester Chamber of Commerce states that the position of the trade in general chemicals has not changed materially during the past year and it does not appear that expectations for 1930 are any more settled. The outlook, it is stated, of the branch of the industry concerned with coal tar products cannot be considered good, and the continued accumulation of stocks of certain products, notably creosote fractions, is causing makers serious concern. Exports of these products, with the possible exception of carbolic acid, have been disappointing.

The effect of the rapidly increasing use of the so-called cellulose lacquers upon the chemical trade, both as to home manufacture and imports, is becoming more and more pronounced and provides almost the one bright spot in a summary of the year's trade. Acetone, the butyl and other similar esters and various ketones used as solvents provide constant additions to an extending list of chemicals formerly known only in text books but now substantial articles of commerce. Progress in the artificial resin and rubber industries is also, though in a lesser degree, contributing to this introduction of new items in price lists.

Amalgamation of great business interests and the formation of associations to regulate the manufacture, distribution, and price of chemicals are features of the period through which we are passing, and the cumulative effect of these factors is to be seen in the changing character of the interests of many, and particularly of the distributing, firms.

PLANT
NITRIC ACID
ACETIC ACID
ACETIC ANHYDRIDE
FATTY ACIDS
PHARMACEUTICAL PRODUCTS
WAXES & CANDLES
GELATINE
EDIBLE OILS
ALCOHOLS
DYES
SUGARS
ETC., ETC.

ALUMINIUM
TANKS
COILS
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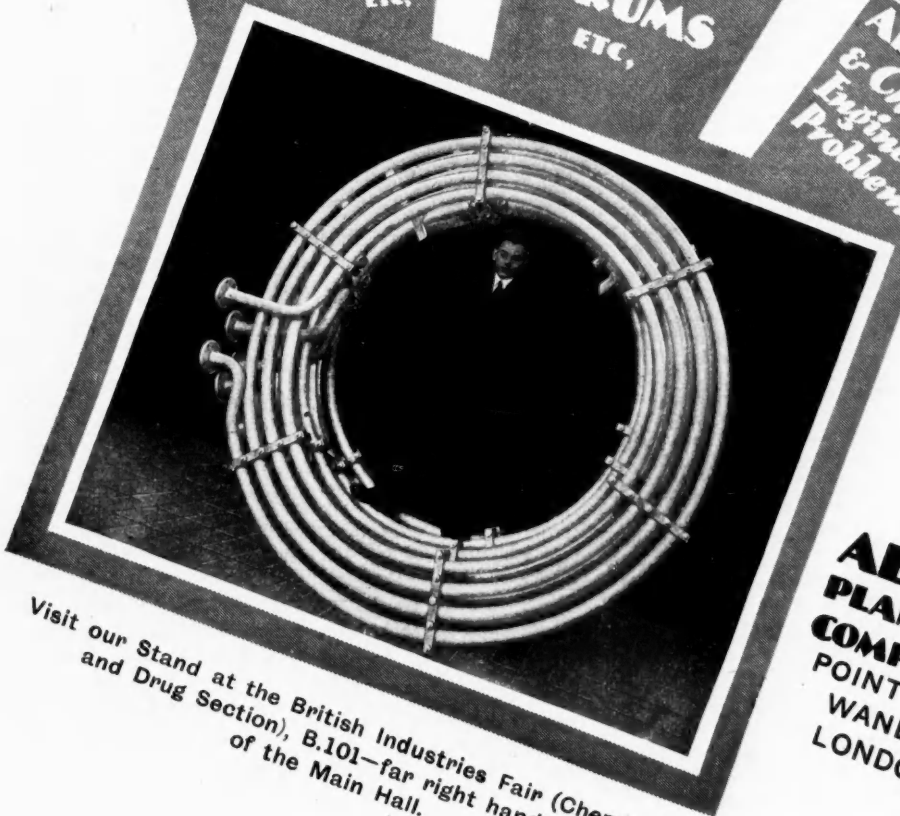
PIPE LINES
STILLS
CONDENSERS
STEAM PANS
AUTOCLAVES
MIXERS
DRUMS
ETC.,

WE WILL SEND A CHEMICAL ENGINEER to place at your disposal TWENTY YEARS EXPERIENCE OF ALUMINIUM & Chemical Engineering Problems



Visit our Stand at the British Industries Fair (Chemical and Drug Section), B.101—far right hand side of the Main Hall.

The ALUMINIUM PLANT & VESSEL COMPANY LIMITED
POINT PLEASANT,
WANDSWORTH,
LONDON, S.W.18

# Manchester Chemical Market

(From Our Own Correspondent.)

*Manchester, February 6, 1930.*

Values are keeping up remarkably well in the chemical market, and only here and there can anything resembling weakness be reported. Contract deliveries of the heavy products to the large consumers in this area are not too good, although they are probably as good as can be expected in view of the fact that dyeing, bleaching and finishing works are in many instances engaged at below capacity. Inquiry for prompt and early delivery parcels is on moderate lines.

### Heavy Chemicals

Chlorate of soda keeps steady at the higher level of £25 to £26 5s. per ton, according to quantity, although, on the whole, demand in this section can only be described as quiet. There is a fair movement of both bicarbonate of soda and alkali and contract prices for these are firm at £10 and £6 per ton, respectively. Caustic soda meets with a steady inquiry, with current contract offers ranging from £12 15s. to £14 per ton, according to quality. Prussiate of soda is in moderate request and prices are maintained at a firm level, from 4¾d. to 5¼d. per lb. still being quoted. Sulphide of sodium has been rather quiet during the past week, but values are unchanged at from £8 2s. 6d. to £9 2s. 6d. per ton for the commercial material and from £10 to £14 per ton, according to quantity, for the 60/65 per cent. concentrated solid. With regard to bichromate of soda, there is fairly steady demand about for this material on the basis of 3⅝d. per lb., less 1 to 2½ per cent. Hyposulphite of soda is well held although buying interest in this section has been somewhat slow; the photographic quality is selling at round £15 per ton, and the commercial at £9 to £9 10s. Phosphate of soda is a quiet section of the market, with the dibasic quality selling in the neighbourhood of £11 10s. per ton.

Permanganate of potash is steady and in moderate request at from 5d. to 5¼d. per lb. for the commercial material and about 5⅝d. per lb. for the B.P. A fair business is being done in bichromate of potash, offers of which are fully maintained on the basis of 4⅜d. per lb. Caustic potash has been only in moderate inquiry during the past week at from £31 to £31 10s. per ton. Chlorate of potash is steady, but demand is quiet at from £26 to £28 10s. per ton, according to quantity. There is a fair demand about for carbonate of potash, values of which are steady at round £26 per ton. Yellow prussiate of potash moves off in fair quantities and quotations are held at 6¾d. to 7¼d. per lb.

Rather lower prices are being taken for sulphate of copper, which is in moderate request at about £26 5s. per ton, f.o.b. Arsenic keeps up at round £16 per ton at the mines, for white powdered, Cornish makes, but there has been no perceptible improvement in the demand for this material during the past week. A quietly steady trade is passing in the acetates of lime, which are on offer at £16 per ton for the grey quality and round £7 15s. for the brown. The lead products are on the slow side, with nitrate quoted at up to £33 10s. per ton and white and brown acetate at £39 and £38 10s.

### Acids and Tar Products

Acetic acid continues to meet with a fairly good demand at firm prices, with the commercial 80 per cent. quality at about £36 10s. per ton and the glacial at £66. Oxalic acid is on the quiet side, but prices of this keep up at round £1 13s. per cwt., ex store. Citric acid is slow and easy in tendency at about 1s. 3d. per lb., as is also tartaric at from 1s. 3d. to 1s. 3¼d. per lb.

Among the by-products, pitch is rather inactive, though values are maintained at 47s. 6d. per ton, f.o.b., with creosote oil also quiet at from about 4d. to 4½d. per gallon, naked. Carbolic acid is firm at round 2s. 7d. per gallon, naked, for 60's crude and 7¼d. per lb., f.o.b., for crystals. Solvent naphtha is steady at 1s. 2½d. per gallon, naked, a moderate demand for the material being experienced.

### Sulphate of Ammonia Duty

In virtue of a Decree dated January 10, 1930, the reduced Czechoslovakian Customs duty of 21·60 Czech kronen per 100 kilogs. on sulphate of ammonia (Tariff No. 599 (g) 2) is to remain applicable until February 28, 1930.

# Company News

Jurgens.—A dividend at the rate of 7 per cent. per annum on the guaranteed 7 per cent. cumulative participating preference shares, was payable on February 1, for the half-year ended December 31, 1929.

Gas Light and Coke Co.—The gross revenue for the year 1929 is stated to be £11,847,905 against £11,554,842 for 1928; the expenses are £10,002,188 as compared with £9,701,322, leaving a net revenue slightly lower at £1,845,717 against £1,853,520. The sum of £145,290 is carried forward.

New Paccha and Jazpampa Nitrate Co.—The gross profit for the eighteen months ended June 30, 1929, including transfer fees, amounts to £4,395, and after providing for repairs and renewals £2,658, interest £547, directors' fees £787, and London office expenses £1,110, the result is a loss of £707; adding the amount brought forward of £8,978, there remains a debit on the profit and loss account of £9,685.

Margarine Union, Ltd.—As a result of the agreement concluded with the Lever Group on September 2 last, involving changes in the articles of association and in the names of both companies, an extraordinary general meeting will be held at Union House, 26, St. Martin's-le-Grand, London, on February 28, at 11 a.m., for the purpose of adopting new articles of association and changing the name of the company to Unilever, Ltd. It is proposed that the additional directors contemplated by the agreement should be elected at the same meeting.

South Metropolitan Gas Co.—The accounts for 1929 show that the total revenue amounted to £4,469,758 (compared with £4,372,725 for 1928), against which is charged expenditure totalling £3,899,148 (compared with £3,810,925). The expenditure includes an allocation of £83,874 (against £82,624) to the co-partnership fund and an allocation of £30,000 (against nil) to special purposes fund. To the resultant profit of £570,610—an increase of £8,810—are added the balance brought from last account of £2,461 and interest and dividend receipts of £39,079, giving a total of £612,150. Interest charges absorb £160,376 (against £153,068), the preference dividend £30,000, and the interim dividend of 2½ per cent. paid in September £167,747. The directors propose to pay a final dividend on March 3 of 3¾ per cent., making a total of 6¼ per cent. for the third successive year on the ordinary shares.

## Chemical Trade Inquiries

*The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.*

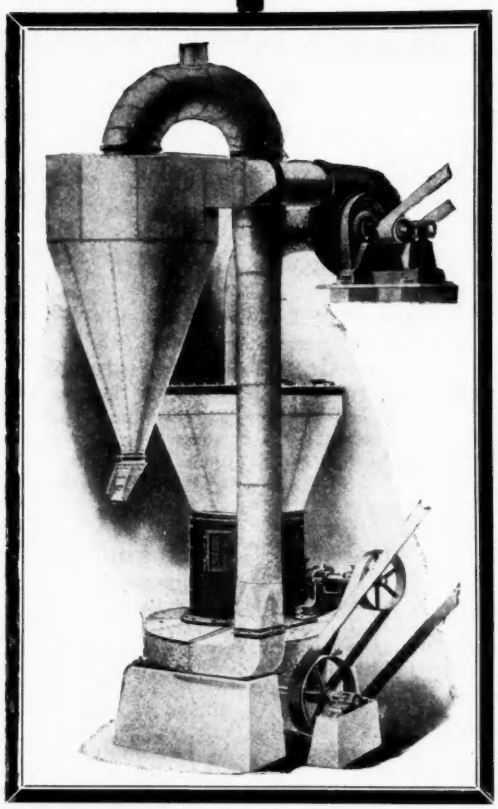
Special Chemicals.—The Commercial Secretary to the Residency, Egypt, reports that the Egyptian Government Assay Office is calling for tenders, to be presented in Cairo by March 1, 1930, for the supply of special chemicals for assay purposes. Ref. No. B.X. 6,122.

Raw Materials.—Representation for Denmark of British exporters of raw materials used in the chemical industries is required by an old-established firm in Copenhagen. Further particulars may be obtained from the Royal Danish Consulate-General, 7 and 8, Norfolk Street, Strand, London, W.C.2.

### Methods of Soil Analysis

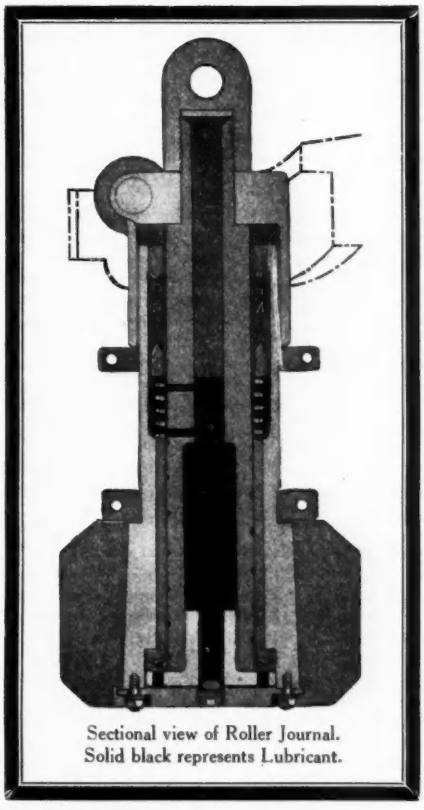
"Soil Analysis" formed the subject of a lecture by Mr. T. Wallace, assistant director of the Agriculture Research Station, Long Ashton, at the meeting of the Bristol section of the Institute of Chemistry. Sound advice on manuring, he said, could not be given on the mere analysis of a single soil sample in the laboratory. It was necessary for the analyst to have a sound knowledge of agricultural practice, of the particular crop requirements, and of the type of soil concerned. The best method of providing a basis for advisory work on crop production was to carry out detailed soil and agricultural surveys, and to follow these up with well-chosen field experiments and chemical investigations on both soils and plants.

# Raymond leads again



with the introduction of the new patented inverted Roller Journal.

This new Raymond Roller Journal has been evolved after long and careful experiment, among the advantages obtained being a great economy in oil, consumption being reduced to 1/30 of the old type.



Sectional view of Roller Journal.
Solid black represents Lubricant.

RECENT orders for Raymond Mills include:—

1 Four Roller Mill to grind Coal, Graphite, Talc, and Clay.
1 Five Roller Mill to grind Titanium Oxide Pigment.
1 Five Roller Mill to grind Iron Oxide materials.
3 Five Roller Mills to grind Coal.
1 Two Roller Mill to grind Fireclay.
1 Four Roller Mill to grind Fullers Earth.

*We shall be pleased to advise you on your grinding problems and are fully equipped to carry out accurate tests.*

## Raymond Roller Mills — Dustless in Operation

**MINING & INDUSTRIAL EQUIPMENT LTD.**
PROPRIETORS — INTERNATIONAL COMBUSTION LIMITED

11, Southampton Row, London, W.C.1.
*Works: Derby & Erith.*

*Telephone* - HOLBORN 7277 (3 lines). *Telegrams & Cables* - HARDRAYMIL, WESTCENT, LONDON.

## Low Temperature Carbonisation

### Some Interesting Results in London

ADVANCE information is now available concerning the results of the "K.S.G." low temperature carbonisation plant at the South Metropolitan Gas Works in London. The installation consists of one standard long, rotary, cylindrical retort of 80 tons of coal per 24 hours throughput, and the average analysis of the raw coal used, that is, gas coal smalls, is 59·69 per cent. fixed carbon, 30·17 per cent. volatile matter, 9·05 per cent. ash, and 2·09 per cent. moisture, with a heating value of 13,615 B.Th.U. per lb. From this the smokeless low temperature fuel obtained is 76·27 per cent. fixed carbon, 12·83 per cent. volatile matter, 10·19 per cent. ash, and 0·71 per cent. moisture, with a heating value of 13,280 B.Th.U. per lb., a shade less than the original raw coal.

#### Low Temperature Tar

The low temperature tar has a specific gravity of 1·061, and an average sample fractionates to (1) 4·6 per cent. water, (2) 10·6 per cent. (94–180° C.), (3) 13·5 per cent. (180–230° C.), (4) 11·0 per cent. (230–270° C.), (5) 26·8 per cent. (270–350° C.), and (6) pitch 33·5 per cent., this latter being a low figure. It may also be stated that the tar acid content (phenols) is 21·55 per cent., while the specific gravity at 20° C. of the 94–180° C. fraction is 0·865, the next fraction (180–250° C.) being 0·942.

The crude light oil scrubbed from the gas has a specific gravity of 0·832, and gives very good fractionation figures with 16 cc. at 80° C., 50 cc. over at 110° C., and 71·2 cc. over at 140° C. Further, the water white refined motor spirit made from the above crude light oil has a specific gravity of 0·769, and on fractionation 100 cc. shows a first drop over at 35° C., while at 90° C. the figure is 24 cc., and at 110° C. the figure is 60·7 cc. with 86·6 cc. at 130° C. and 96·5 cc. at 150° C., this being of course equal to ordinary petrol. The other general properties, such as little or no tendency to discoloration and "anti-pinking," are also very good.

#### Smokeless Fuel Balls

The residual smokeless fuel is obtained in the form of balls of varying size, from 5 in. diameter down to about ¼ in. diameter, constituting an extremely convenient fuel for the ordinary household fire, the action being, of course, that during the plastic stage the bituminous coal dust and smalls agglutinate to some slight extent, and by the "sluicing" action of the retort are rolled into these ball-shaped pieces, which, however, are not too large to prevent complete carbonisation, largely due to a jet of highly superheated steam passed into the charge at the period of plasticity. The action is further aided because this point is also the highest temperature of carbonisation, that is, about 1200° F., when the material falls out of the inner cylinder into the outer one.

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### American Chemical Society's Budget

A GIFT from the Chemical Foundation of America, of which Mr. Francis P. Garvan, of New York, former Alien Property Custodian, is president, has enabled the directors of the American Chemical Society to adopt a 1930 budget $95,000 in excess of the Society's normal income. The budget total is $557,525. Without the support of Mr. and Mrs. Garvan and the Chemical Foundation, it is stated the publication of much valuable chemical knowledge, both in pure and applied chemistry, would have been impossible. The contribution makes possible the expansion of the society's work in preserving the record of research. To bring to American science and industry a knowledge of every fresh development in chemistry, the society has developed a reporting system, centred at Ohio State University, which now covers the world's entire chemical literature, and is embodied in the publication *Chemical Abstracts*. The number of periodicals from which digests are made for American use now exceeds 1,500. Mr. and Mrs. Garvan have given large sums to chemistry in recent years. They have endowed institutions for the study of cancer and tuberculosis. They provided about $200,000 to study the common cold. They have expended more than $250,000 for annual prize essay contests in schools and colleges. Mr. Garvan received the last award of the Priestley Medal as "the greatest lay patron of chemistry."

# Commercial Intelligence

*The following are taken from printed reports, but we cannot be responsible for any errors that may occur.*

## Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case, the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

HOLDEN (ARTHUR) AND SONS, LTD., Birmingham, varnish makers. (M., 8/2/30.)—Registered January 24, £100 debentures part of £20,000; general charge. *£10,900. July 12, 1929.

STEAROLENE, LTD., London, W.C., oil refiners, etc. (M., 8/2/30.) Registered January 18, charge to Bank; charged on Victoria Works, Croft Street, Clayton.

### Satisfaction

READE BROTHERS AND CO., LTD., Wolverhampton, chemical manufacturers. (M.S., 8/2/30.) Satisfaction registered January 22, £3,000, registered July 10, 1908.

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## New Company Registered

BRIGHTMORE'S NITRATES, LTD., 51, The Wardwick, Derby.—Registered January 30. Nominal capital, £300 in £1 shares. To acquire the business of a chemical manufacturer and chemist carried on by J. Brightmore at Tideswell, Derbyshire. Directors: J. Brightmore, F. S. Goodwin, and S. Orme.

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## Affairs of Blount and Co.

### Changes in the Directorate

FOLLOWING on the non-payment of the preference dividend due on January 15, Blount and Co., the combine of hosiery manufacturers floated a few years ago, have issued a statement that since the last annual meeting there have been considerable changes in the directorate, Messrs. Blount, Grant, and S. Miall having ceased to be directors. Sir William Pope, Mr. L. S. Moore and Mr. F. J. Perry, who were elected directors since the last annual meeting, have also resigned, and Messrs. R. J. Weston, F.C.A., and O. J. Jackson, both of Derby, have recently been elected to the Board. The Board, as thus reconstituted, are reviewing the position of the company and are having the accounts brought down to December 31, 1929, so as to be in a position to report to the shareholders to as recent a date as possible. Meantime, they regret to state that it is in their view inadvisable to pay the preference dividend for the half-year to December 31 last. The accounts to that date are in course of preparation and as soon as possible the directors' report will be issued and a general meeting of the shareholders convened, when a full explanation will be given as to the position of the company.

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### New Chemical Projects in Australia

ALTHOUGH the Australian chemical trade reflects some depression in certain other industries, states a report by the U.S. Trade Commissioner in Melbourne, the absence of extensive general depression in commerce is indicated by plant capacity expansion and experimental projects both individual and merged in large and small undertakings. For example, Felton Grimwade and Co., are experimenting on the production of carbonic ice for commercial development. A large scale investigation on the possibility of producing synthetic fixed nitrogen by the Electrolytic Zinc Co. of Australasia (Ltd.), was merged with similar investigations by several companies. In association with Commonwealth Fertilisers, Electrolytic Zinc is acquiring a block of shares in I.C.I. and already holds shares in Australian Fertilisers. Moreover, this Zinc Co. joined other interests in the promotion of Synthetic Coal Oil Products Pty. (Ltd.), a large scale hydrogenation investigation.